The Chemical Age

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Atmospheric Pollution

THE pollution of the atmosphere is the concern of every single person in the country, because the gaseous, liquid and, to a less extent, the solid impurities cause corrosion of plant, decay of buildings and injury to health. But because it is the concern of everybody, it has seemed for long to be the business of nobody to rectify matters. The steps that have been taken to reduce smoke emission from factory chimneys through powers given to local authorities have done something, but the problem is wider than that. The deleterious effects of sulphur have been recognised by the steps taken in some large power stations to wash the waste gas for the removal of sulphur dioxide and trioxide, as well as grit particles, before passing it out into the atmosphere. The problem for the large installations is one of chemical engineering.

The Department of Scientific and Industrial Research undertakes an investigation of atmospheric pollution and publishes each year a lengthy report upon the subject, which consists for the most part of tables of observations. It is unfortunate that this report is always a year old before it is published. One wonders what would be the reaction of shareholders to a board of directors which published on March 30, 1938, the accounts for the year ending March 31, 1937. The report of the investigation on atmospheric pollution just issued shows that progress in the purification of the atmosphere is very slow. The most that can be said of the year ending March 31, 1937, is that the tendency is in the right direction, and that it is possible that an improvement in the condition of the atmosphere may be beginning; no definite conclusions can be drawn from the figures submitted, however. Compared with the general average for the five years ended 1932, which is taken as a basis of comparison in the report, fewer observing stations than the previous year show a marked reduction in tar deposit, but on the other hand fewer stations show an increase. There is some indication of improvement in the quantity of deposits of fine particles of fuel escaping up chimneys and in that of organic dust of various kinds. Ash deposits also show an improvement and there is a welcome reduction in sulphate deposits. In view of the increased industrial activity and of the greater spending power of the country which may well have led to greater use of fuel, it cannot be said that these figures are unfavourable.

The corrodibility of an atmosphere is not wholly a function of fuel utilisation, nor is its corrosive power necessarily correlated to its effect on health. The chemical examination of deposits generally embraces seven constituents. Of these tar is undoubtedly a sign of smoke pollution. Carbonaceous matter other than tar may result from soot or fine particles of fuel escaping with chimney gases—again a matter of fuel utilisation; but it may also be derived from hairs, textile fibres and all the many forms of organic matter arising from decay. It has also been shown that there is an aerial insect plankton drift at heights between 45 and 400 feet, so that fuel may not account necessarily for the organic matter found in the deposits. Ash, again is not necessarily derived from coal; it may be wind-borne dust. Portions of this dust can be carried long distances and can remain in the air for great lengths of time.

The soluble matter collected with the rain may also have very varied sources; SO_2 and CO_2 from the air bring into solution many forms of inorganic material, not infrequently derived from the decay of buildings or iron-work. Sulphates are derived from the combustion of fuel, or from chemical operations, but chlorides are primarily derived from sea-water, though the presence of up to 1 per cent. of chlorine in coals must not be disregarded. Lime is derived from sea-spray or from dust projected into the air. Ammonia may come from coal, from chemical operations, or from the decay of nitrogenous organic material; very little ammonia is produced by the low temperature distillation of coal, as in combustion. These examples are sufficient to show the complexity of the problem, but it is also to be remembered that the location of the testing station may affect the results, as for example the proximity of building operations, the height above ground, pollution carried from neighbouring works, or even from neighbouring towns.

Complex as is the interpretation of the results, the plain fact is that the air in and around towns, and especially industrial towns, is highly polluted. It is bad for the lungs, and it screens off the ultra-violet radiation. Most wind-borne dust settles quickly, though minute particles of the order of 0.001 mm. settle very slowly; that is a problem for the road engineer. The decay of organic matter should not to-day account for much pollution, and it is a matter for the sanitary authorities. Undoubtedly the arrangements made for the collection of refuse in many towns leave much to be desired, and may account for a larger proportion of pollution than many believe. The prime cause of atmospheric pollution, however, is smoke. The coal interests desire just now to perpetuate the use of raw coal, but we submit that where raw coal cannot be burnt smokelessly, it should not be permitted to be burnt at all, provided that the gas, electricity and coke oven concerns can supply the necessary heat at the same price.

Notes and Comments

Anniversary Meetings of the Chemical Society

THE anniversary meetings of the Chemical Society were held this year in Manchester, on Thursday and Friday of last week. It was not the first time that the Society had visited the city for the purpose of these meetings, for they were held there in 1926, the first occasion in the Society's history on which a venue outside London was decided upon. Mainly through the scholastic achievements of its university, which would be famous for its work in chemistry alone, Manchester has an enviable reputation for education and research. When reflecting on the industrial activities of the city, one invariably thinks of cotton on which its solid reputation in manufacturing and trading was originally built up. But although cotton is a major local industry, other manufacturing trades in immense variety are represented and have established the city as one of the leading industrial centres in the country. A background formed by this association of education and industry provided a most fitting setting for the meetings of the Society.

Programme of Events

AS usual, a full and varied programme of events was undertaken. On the Thursday, following the 97th annual general meeting, Professor F. G. Donnan delivered his presidential address, "Chemistry: Retrospect and Prospect." It is intended to publish extracts from the address in next week's issue. In the evening the anniversary dinner was held at the Midland Hotel. Both the address and the speeches at the dinner were outstanding for their excellence; abstracts of the latter are published on pp. 281-3. Visits to works are an ever popular feature of annual meetings and conferences, and the present meeting was no exception. Of the visits arranged for the Friday morning, fellows and their guests had the choice of visiting either the Shirley Institute, the research and service laboratories of I.C.I., Ltd. (Dyestuffs Group) at Blackley, or the research laboratories of the Alkali Group of I.C.I. at Northwich; in every case the parties, which were limited in number, were booked to capacity. In the afternoon Professor G. Barger delivered a memorial lecture on the life and work of Amé Pictet, who died on March 11 last year. He was described by Professor Barger as one of the last representatives of classical organic chemistry, his work being very largely devoted to the structure and synthesis of natural products. A most successful meeting was concluded on Friday evening by a reception by the Council of the University of Manchester in the Whitworth Hall of the University.

Prospects for the Taxpayer

THE harassed business man has so few certainties in this world that he will be grateful for the assurance that he will have no new taxes to pay as the result of this year's Budget. This assurance is not straight from the Chancellor of the Exchequer's mouth, for he will not make his statement until towards the end of the month. It is, however, equally sure, as it is stamped upon the face of the official returns of revenue and expenditure which are now available for the last financial year. The taxpayer played his part so nobly during 1937-8 that ordinary revenue exceeded ordinary expenditure by no less than £39,329,680. That is avowedly the most optimistic way of looking at the figures. There is still, however, left what the authorities term a "disposable surplus" of £28,785,428, after redemption of debt has been allowed for. As there is little reason to fear any contraction of revenue in the next twelve months, taxpayers would expect in the normal course a remission of their burdens on figures such as the Treasury are able to announce. Unhappily, these are abnormal times, and besides financing the services of the State on an hitherto unheard of scale in peace-time, the Government have taken authority to finance a large part of the re-armament programme by special loans. It would be against the canons of good finance to remit taxation with one hand and borrow freely with the other. The taxpayer must be thankful for small mercies. The thirty or forty millions which the Chancellor of the Exchequer finds unexpectedly at his disposal will be available to remove the reproach that re-armament against present dangers is being debited to the account of future generations. The satisfying condition remains that there cannot possibly be an increase of direct taxation for another twelve months at least.

The Location of Industry

THE Federation of British Industries, in submitting evidence to the Royal Commission on the Geographical Distribution of the Industrial Population last week, made some interesting deductions as to the future conditions of population distribution. Owing to the decline in numbers of total population likely to take place within a generation the problem will probably be one of transferring those already employed and trained for specialised occupations from one section of industry to another. Industry is tending to become relatively less and less important as a means for providing employment, being replaced by distribution and services in this respect. The adoption of a protectionist policy in 1931 caused a fairly widespread redistribution of population and industries in favour of the home as opposed to the export market. The movement of population from old centres to new, and the aggregation of population in large urban areas, with a similarly increasing proportion of the occupied urban population employed in distribution, entertainment and other services, are factors which may be disadvantageous from the national point of view.

Proposed Department of Industrial Information

FROM the industrial standpoint, the Federation points out, any attempt to overcome these disadvantages by State control of the location of industries would be open to the gravest objection. It is maintained that the manufacturer himself is the person best qualified to ascertain in what locality he can carry out his business at a profit but, at the same time, he is sensitive to the causes of local and national welfare and is anxious to do what he can in this direction. The Federation, therefore, suggests that consideration might be given to the desirability of setting up a department of industrial information, under the auspices of the Board of Trade. This department would provide the manufacturer with all that he wanted to know concerning the facilities and services of the various localities. It would not make recommendations as to districts but rather assist the manufacturer in forming his own opinion. The F.B.I. has only considered the industrial aspects of the Royal Commission's problem and not specifically dealt with the problem of the Special Areas, which has to be treated as a national social question. But it is satisfactory to see that it considers the inducements offered to the establishment of industries in the areas to be valuable.

The Identification of Naphthalenoid Intermediates

A Short Review of Suggested Methods

By
W. HOLBURN, A.I.C.

THE identification of commercial dyestuffs is a matter of everyday importance and tables to assist in this direction are already in existence. Those of Green ("The Analysis of Dyestuffs") have for long served as the standard, and recently the tables of E. Clayton ("Identification of Dyes on Textile Fibres") not only include the analysis of dyestuffs, but also give reliable methods for the identification of any metals on the fibre ("Detection of Metals in Fibrous Materials, Dyes, and Organic Pigments.") In the case of the identification of naphthalenoid intermediates, however, one is forced to rely largely upon the original literature and in this respect the *Journal* of the Society of Dyers and Colourists is of invaluable help. The analysis of intermediates presents a two-fold problem; first, and without doubt the most important, the analysis of intermediates produced by the decomposition of a dye, and second the analysis of intermediates in the bulk. Both aspects have been kept in mind in the short summary of the suggested methods that follows.

Decomposition by Reduction

Reduction methods are perhaps the most important means for bringing about the decomposition of an azo dye. Various reagents may be used to effect this reduction, but acid stannous chloride or hydrosulphite appears to be the most important. The use of acid stannous chloride was first suggested by Witt in 1888, and hydrosulphite by Grandmougin in 1906. Reduction of azo compounds causes fission of the molecule at the double bond of the azo group and as a consequence two aromatic amines are produced. It is important to note, however, that by this method all secondary components will appear as amino compounds, the position of the amino group indicating the point of coupling. Thus the naphthol-sulphonic acids will appear as amino naphthol sulphonic acids, and naphthylamine sulphonic acids will appear as diamines. The primary components will, of course, appear unchanged. The most useful method for the identification of the secondary components appears to be that of Forster and Hanson (*J. Soc. Dyers Colourists, 42,* 272), their work being an extension of the methods suggested by Green ("The Analysis of Dyestuffs.")

Forster and Hanson's Method

The dye is reduced with a suitable reagent, i.e., acid stannous chloride or hydrosulphite, and concentrations are so arranged that the amino-sulphonic acids so formed crystallise out on cooling. The crystals are filtered off and washed from the hydrochloride of the primary component and stannous chloride. The identification consists entirely of colour reactions. The material is dissolved or suspended in water and made alkaline by the addition of ammonia. The ammoniacal solution is spotted on filter paper with the following solutions; hydrochloric acid, ferric chloride, vanadium chloride, potassium dichromate, nickel chloride, uranium sulphate, potassium ferrocyanide, potassium ferricyanide, copper sulphate, Schweizer's reagent, ferrous ammonium sulphate, cobalt nitrate, and silver nitrate. In each case the colour developed is noted. A second series of filter-paper is treated with the ammoniacal solution and dried for three minutes at 80° C. in a water oven, then submitted to the same spotting reagents. The original paper contains a complete table for the colour reactions of the thirty-nine derivatives studied, which are, of course, all amino compounds. The table will naturally serve equally well for the identification of aromatic amino compounds in the bulk.

A second method for bringing about the decomposition of an azo dye is by the use of fuming nitric acid which causes a rupture of the molecule between the N-atom of the azo group and the C-atom of the secondary component. This causes the diazonium compound to be regenerated as the nitrate while the secondary component appears as a nitro-derivative. The action of nitric acid on azo compounds was first investigated by Meldola and Morgan in 1889, and it is now established as a valuable supplementary reagent for use in those cases where difficulty might be experienced by the use of the more generally employed reduction methods, i.e., when nitro groups are present. The action of other acids has been investigated (cf. Rowe and Dangerfield, *J. Soc. Dyers Colourists, 52,* 48).

The diazonium nitrate may be separated from the nitro derivatives of the secondary component by pouring the nitration mixture on to crushed ice. This generally causes the latter compound to separate out, the diazonium nitrate remaining in solution. Rowe and Levin (*ibid 40,* 218) describe methods for the identification of the diazonium nitrate by coupling with an azo component, such as β-naphthol, naphthol AS, etc. The azo compounds thus formed have usually well defined melting points by which they, and consequently the diazo component, can be identified. The method depends on the large variation in the melting points of isomeric aryl-azo-β-naphthol derivatives, and of isomeric aryl-azo-β-hydroxynaphthoic acid anilide derivatives. The paper contains tables of melting points for both the β-naphthol and the naphthol AS series and a large number of amines have been studied. Due to the simplicity of diazotisation and preparation of these azo compounds, the method becomes a reliable one for the identification of aromatic amines in the bulk.

Identification by Crystalline Form

A rather different method for the identification of naphthalenoid intermediates is that of W. Garner (*ibid 52,* 302). Garner studied the crystalline form of various naphthol, naphthylamine, and amino-naphthol sulphonic acids. In addition to the free acids, the sodium salts, zinc salts, and benzylisothiourea derivatives have been investigated. Tables are, of course, given showing the crystalline form of the various aromatic sulphonic acids and their derivatives, but unfortunately only twenty derivatives have been studied. The method has the attraction, however, that since the crystallisations may be allowed to take place on a microscope slide, the method becomes one of micro-identification.

The use of chromatographic adsorption is increasing and it is of interest to note that Ruggli and Jensen have found it possible to separate - and β-naphthol derivatives by the different rate of adsorption on to activated aluminium oxide.

When intermediates are supplied in the bulk it is rarely possible to carry out an identification by immediate melting point determinations due to the fact that the sulphonic groups are usually present as sodium salts. Identification can, however, be carried out by the preparation of two derivatives, i.e., the sulphonyl chloride and the chloro-naphthalene derivative from the sulphonyl chloride. Thus naphthionic acid on treatment with phosphorus pentachloride gives -chloronaphthalene-4-sulphonyl-chloride, melting point 95° C., while 1:4-dichloronaphthalene has a melting point of 67.5° C. Similarly Laurent's acid gives a sulphonyl chloride of melting point 95° C., but 1:5-dichloronaphthalene has a melting point of 107° C. Confirmation can also be obtained from the melting points of the sulphonamides. A scheme of identification based upon the melting points of the sulphonyl chloride, the chloronaphthalene, and sulphonamide derivatives appears to be quite possible, and is suggested by Thorpe ("Dictionary of Applied Chemistry"), although such a scheme does not appear to have been systematised in any way.

Progress of Italian Self-Sufficiency

The Part Played by the Montecatini Concern

IN the realisation of the Italian self-sufficiency programme, the Montecatini and associated companies have an important part to play, the importance of this group being revealed by the fact that it accounted for one-tenth of the Italian consumption of electrical power last year. The recently published report of the company gives some interesting figures, which show how the gaps in the programme are being filled. Taking the results of the mineral department, the subsidiary Montevecchio produced last year 29,057 tons of lead ore (27,171 tons in 1936), this being some 50 per cent. of the total national output of 57,912 tons (50,210 tons). Imports of lead ore were thus reduced from 21,594 tons to 13,455 tons, although, to be sure, imports of lead in metal form show some increase at 10,786 tons (8,966 tons). Domestic lead production amounted last year to 32,300 tons (29,209 tons), of which 16,631 tons, or 50 per cent., was accounted for by the subsidiary Soc. It. Piombo e Zinco. The autarchy programme, it is stated, contemplates an output of 45,000 tons by 1940. Italian zinc production amounted last year to 37,767 tons (27,295 tons), the new Montecatini works at Marghera producing 11,439 tons, or 31 per cent. It was thus rendered possible to decrease imports to 879 tons (3,433 tons), and it can therefore be said that in this case self-sufficiency has been practically achieved. At the same time plans are under consideration for a further increase in zinc production; in particular a whole range of zinc alloys is to be produced, which are intended as far as possible to replace copper in general use. Particularly noteworthy is the high share of the group in Italian pyrites production, amounting to 808,487 tons or 89 per cent. of the total. By the desulphurisation of the native pyrites, the concern achieved last year an iron ore output of 587,000 tons. In the case of aluminium, national production increased last year to 22,948 tons (16,174 tons), of which 13,221 tons or 58 per cent. was accounted for by the Montecatini concern. According to the autarchy programme, an output of 40,000 tons will be reached by 1940.

In the production of acetate silk, the company through its subsidiary Rhodiaceta Italiana, achieved last year a 40 per cent. increase in production, the output being 1,744,000 kilogrammes (1,284,000). Much importance is attached to the research being pursued by the associated company Elettrochimica del Toce, which is working on processes for the economising of the raw material, cotton linters.

In the dyestuffs department notable progress is reported. The ACNA Company is now producing high-quality indanthrene dyes, and its first products recently appeared on the market.

Letters to the Editor

Tar Distillation

SIR,—In your editorial note under the heading of "Tar Distillation" in your issue of April 2 you refer to the distillation of tar in pipe stills and you mention the Koppers still installations at Beckton and in Yorkshire.

You may be interested to know that a battery of Foster-Wheeler pipe stills was erected for the distillation of coke oven tar at a very large steel works in America some 10 years ago by one of our associated companies, Robinson Brothers, Ltd., in conjunction with Wm. Butler and Co. (Bristol), Ltd., of Bristol. These stills proved entirely satisfactory.

It was largely as a result of experience gained in this way that this company placed an order with Foster Wheeler, Ltd., of London, for two pipe stills for the distillation of crude tar towards the end of 1935. These units have since been erected and put into operation and, so far as we know, are the first of their kind to be used for the distillation of tar in this country.—Yours faithfully, for The Midland Tar Distillers, Ltd.,

R. B. ROBINSON,
Director.

April 5.

Team Valley Trading Estate

Opening of Exhibition at Charing Cross Station

AN exhibition of the Team Valley Trading Estate was opened by the Minister of Labour, the Rt. Hon. Ernest Brown, at Charing Cross Underground Station on Tuesday. The exhibition, staged on an attractively decorated stand, consists of models depicting the lay-out and facilities of the Team Valley Trading Estate and photographs showing the types of factories which are at present under construction or have already been erected. Full information regarding the estate can be obtained at the exhibition, which also plays the part of an efficient inquiry bureau.

Col. K. C. Appleyard, Chairman of the North-Eastern Trading Estates, in introducing Mr. Ernest Brown, referred to the great debt of gratitude owing to the L.P.T.B. and particularly its Chairman, Lord Ashfield, for their generosity in providing the site for the exhibition and their help in advertising it on their tube stations. He said that the problem of those areas in Great Britain which had grown up round the heavy industries of iron, coal and steel, and which had suffered so much during the recent depression because of their dependence on those industries, was one which had struck the imagination and sympathy of both Parliament and the public, and among the measures devised by the Government for the relief of those areas was the creation of Trading Estates, of which the Team Valley Estate was the first and largest.

As a Government activity it was unique in several ways—first, because it was a new activity for a Government, second, because it was an original endeavour to create a planned industrial area, next because although the shareholders in the enterprise were the taxpayers of the country, the administration was in the hands of an ordinary commercial board and this great property and undertaking was in law the property of the company which the Government had set up to create and administer the estate. The people in the North-East were intensely grateful to the Government for taking their courage in their hands and embarking on this experiment. The support and encouragement given by the Minister of Labour, Mr. Ernest Brown, to this enterprise were unbounded, as was the help of his department, and it was therefore a source of the greatest satisfaction that he was present to open this exhibition which showed something of what England can do—even in a small way.

In declaring the exhibition open, the Minister of Labour said that it gave him very great pleasure to do that service and expressed his gratitude to Lord Ashfield for providing the site for the exhibition. For however valuable the facilities of the estate might be, the success of the enterprise depended upon making those facilities as widely known to the public as possible. He said that he had some figures concerning the trading estate which illustrated its progress far more effectively than anything that he could express in words. Development work on the estate started in October, 1936, with 1,500 men employed continuously on building and development, on which more than £750,000 had been spent. In the 700 acres of the Team Valley, 7¼ miles of roads, 9 miles of railways, and 33 miles of service conduits had been laid. 94 tenants had been secured, with 40 factories occupied, employing just under 1,000 people. The total factories let were expected to employ 9,000 people when in reasonable production. In conclusion, he wished the great experiment the triumphant success it so richly deserved.

Finally, Sir George Gillett, the Commissioner of the Special Areas, made a brief speech in which he paid a tribute to Colonel Appleyard and his colleagues for their great efforts.

EXPERIMENTS on the production of technical and edible oils from grape seeds have been in progress in Germany during the past 2 years. About 25 machines for separating the seeds were installed in different districts in the past year and the number is to be increased to 300 this year. About 10,000 gallons of oil were extracted in 1937.

Anniversary Dinner of the Chemical Society

Lord McGowan on the Society's Importance to Industry and the Advantages of Rationalisation

THE anniversary dinner of the Chemical Society was held at the Midland Hotel, Manchester, with Professor F. G. Donnan, president, in the chair presiding over a company of some 250 members and guests.

After the loyal toasts had been honoured, Professor J. C. PHILIP proposed "The City of Manchester." He said that it was a pleasurable duty to propose the prosperity of the city, and it was particularly appropriate at the present time for it was in 1838 that Manchester first received its charter of incorporation. In those days, the industrial revolution had already been in operation for many years, and the conditions which it had created were very far from being satisfactory. During the hundred years which had passed since municipal organisation in Manchester first began, there had been a steady effort to deal with these conditions. Examples of the progress which had been made could be seen in the vast improvements effected in public health, sanitation, housing and in the erection of dignified public buildings. The annals of Manchester would occupy a very high position in the records of municipal authorities. This was owing to the outstanding qualities of its citizens, who, Professor Philip added, had a good conceit of themselves (and quite properly so); qualities which were so much in common with those found on the other side of the border! In music and art, Manchester had achieved a very notable position, and had succeeded no less in the fields of journalism and education. This alliance of commerce and culture could not be brought about without difficulties. Manchester was to be congratulated on having attained this alliance in so marked a degree.

We chemists, he continued, appreciated the great assistance which Manchester had given us with our science, through men such as John Dalton. These men had been responsible for putting Manchester in the high place which she filled today as one of the main centres of the chemical industry in this country. Professor Philip associated with the toast the name of the Lord Mayor of Manchester, Alderman J. C. Grime. He said that Mr. Grime was an active and worthy successor to those who had gone before him in the important position which he now occupied.

The Lord Mayor of Manchester's Reply

The LORD MAYOR, responding to the toast, said that he found himself faced with the same difficulty which confronted all lord mayors in replying to this toast in that they did not know what was going to be said about their city. At all events, they rarely heard the toast proposed in such a finished manner as Professor Philip had done it, and he would like to thank him for his kind references to Manchester and its Lord Mayor. Manchester was an industrial and commercial centre, with the Shirley Institute one of its outstanding features. He thought that some greater public interest might be taken in Manchester in organisations such as the institute; for although they were, so to speak, on the doorstep of the city, many of the population did not know of their existence. He was glad to remember that Manchester University had turned out many men who had played very important parts in the development of chemistry and in the recognition of its value. In concluding, the Lord Mayor expressed the hope that the Chemical Society would see their way to hold future meetings in Manchester and again let the city have the honour of receiving such a distinguished company as it had been so pleased to do on this occasion.

Proposing the toast "The University of Manchester," Sir ROBERT PICKARD pointed out that in remembering Manchester University, chemists were apt to go back a long way to the time when it was Owen's College. They would bring to their minds the names of Edward Frankland, Roscoe and Schorlemmer, Dixon, Perkin and many others, and recall what tremendous services they had done to their science and the country. Roscoe would be rememberd for his pioneer work on the purification of metals, Dixon as the first to investigate the cause of explosions in mines, and Perkin for disclosing the secrets of essential oils and discovering that large chemical organisations could be built up without the aid of plants. Manchester University had a huge claim to the affections of the Chemical Society, and especially he expressed the appreciation of the Society to Professor Lapworth, an old colleague and friend. In referring to the great chemists who had been professors at the university, he mentioned Professor Heilbron, who was now going to London University to take the chair of Organic Chemistry at the Imperial College, South Kensington. Attention was drawn to the fact that Manchester University was concerned with other subjects, subsidiary to chemistry, and he wished these to be remembered in drinking to its health and prosperity. The University thought very highly of its Vice-Chancellor, Professor Stopford, and it was to be congratulated on having such a man in that position. In proposing the toast, Sir Robert coupled the names of Professor and Mrs. Stopford with the University of Manchester.

Lord McGowan, K.B.E., D.C.L., LL.D.

The Vice-Chancellor of the University of Manchester, Professor J. S. B. STOPFORD, responding to the toast and thanking the proposer for the references made to the university, himself and his wife, said that Sir Robert Pickard led a double life with great success. On Monday, he was in London as Vice-Chancellor of the University, and on Tuesday he was back in Manchester as the director of the Shirley Institute. However, Professor Stopford went on, as a member of the Court of Governors of Manchester University it was highly improper for him to have proposed this toast, but he would like to congratulate Sir Robert upon his restraint. From the earliest days of Owen's College down to the present day, it had always been the policy of the university authorities to find the best possible men to fill vacant positions on the staff. First consideration had always been given to the personnel.

In watching the progress of science, three outstanding points brought themselves to notice. The first was the changing face of science. Increasing specialisation and the rapid advances that were being made were breaking down the borders between subjects. These changes were creating quite serious difficulties for administrators and for this reason the organisation and the building must be made as flexible as possible.

The second striking feature was the closer contact between the scientific departments of the universities and industry. This contact was being brought about by three stages. The first might be termed flirting—getting to know one another; and the second courtship—both parties recognising each others sphere of activity and taking the first steps to help each other in their work. He hoped that we were now passing to the third stage, marriage, representing full co-operation and mutual confidence.

Lord McGowan's Speech

LORD MCGOWAN, proposing the toast of "The Chemical Society," first of all thanked most sincerely the President and members for the honour of being asked to propose the toast of the Society. He said that the science of chemistry was so far-reaching nowadays that he supposed its implications were beyond the grasp of one man; they certainly were beyond him. Our science was at any rate unique in that of all the sciences chemistry alone had given its name to an industry. He did not know why this should be the case—perhaps it was because the research worker and the scientist had been more closely associated in this industry than in any other industry. Perhaps it was by chance, for some of the older processes of the heavy chemical industry had grown from experience rather than from plans made in a research laboratory, and it was interesting to note how little the broad principles on which many of these processes were based had been changed by the application of fresh knowledge. He gave the following illustration of what he meant: The ammonia soda process which actually started in England—by Dyar and Hemming—and first of all put into commercial application by the Solvays of Brussels, was later developed to a remarkable pitch of efficiency by the late Dr. Ludwig Mond, the grandfather of his present colleague, Lord Melchett. Now the general chemical conditions under which this process works have not yielded an inch before the march of subsequent research. Many an earnest and enthusiastic young research chemist has worked out the theory of the ammonia soda process to the last insignificant detail only to find to his astonishment, and possibly to his dismay, that the conditions under which it was already working were the correct ones chemically, but this applies, of course, only to the broad principles. The details upon which the economy of modern production depends are the result of continuous research.

Modern chemical processes generally arise from systematic research, Lord McGowan continued, and science is essential in every step of their development. He considered a branch of organic chemistry as an example. In a country which is so staunch an adherent to tradition as this, people may still be found who affirm that there is nothing like the old-fashioned dyes, or that the ancients had an enviable knowledge of dyeing processes. Nothing could be further from the truth. He believed he was right in saying that the ancients only had nine dyes which we should describe to-day as even moderately fast. The modern dyestuffs industry was the result of research persistently and methodically carried out, but he felt strongly that the industrial research worker in whatever branch of science he was working, had obtained his inspiration and learnt his methods of research from academic workers. He said that his company had a keen interest in the furtherance of academic research; it was continually their care and endeavour to do what they could to make easy the path of the research worker in our universities.

The Society's Importance to Industry

It was of importance in conducting research to realise and appreciate the value of the known in unveiling the unknown. After all every traveller who was setting out on a journey into uncharted country began by planning his expedition with the most meticulous care. He first went carefully over every fact that was known about the country—the best routes to take, the chief geographical obstacles he might meet, the vagaries of its climate and the type of clothes, equipment and transport that was best suited to the country. In short, the sensible traveller wished to reach the edge of the unknown without undue waste of time, energy or expense, and as well equipped as he could possibly be to start on the really important part of his journey, i.e., the unknown. There was no point in exploring where exploration had already been done.

The chemist should adopt the same principle. He should not start research over ground already covered, but on the other hand should demand complete knowledge of all the facts which had been discovered up to date in the subject on which he was working. There was no effort quite so futile as that which ended by discovering something which was already well known to others. That is why the Chemical Society, as an institution which provided our chemists with a vast amount of data to enable them to begin their attack on the unknown from the very frontier, was of such enormous importance to the chemical industry. He emphasised this aspect of the Chemical Society's work because sufficient credit was seldom given to those who were engaged in the laborious but unspectacular compilation of records which were so valuable in preventing waste of effort later on.

By bringing together and publishing the fundamental discoveries of research workers and abstracts of all branches of pure chemistry, the Chemical Society provided the basis for further progress in the development of the science. To use a military metaphor, it was the Chemical Society which consolidated the ground won and gave the chemist a jumping off pitch for each fresh assault.

For one cause or another, scientific societies had experienced a very difficult period in the last twenty years. There was no doubt that the growth of large research institutions, whether financed from Government or private funds, in which the research worker could feel a stability of employment and which were provided with adequate libraries and other resources, had tended inevitably, Lord McGowan felt, to lessen the membership of this and other societies of a comparable character. This was regrettable, and he was therefore extremely glad to know that the Chemical Council was endeavouring to attract more members to the societies. He also heard that the three societies which worked together on the Chemical Council were already effecting economies in the printing and circulation of their publications.

The Keynote of Rationalisation

As one who had not been unconnected with the school of thought to which the word "Rationalisation" had been given, he hastened to congratulate all concerned on this move. Although the two Societies and the Institute had as their general aim the welfare of the science and profession of chemistry, they each pursued their objective by different routes, and he had no doubt that the rationalisation of their methods was no less difficult than the problem of rationalisation in industry, although just as necessary.

In this country, in which we prided ourselves upon our individualism, the problem was always to equate the human factor with the process of rationalisation. It should be our aim to safeguard our precious heritage of being able to agree to differ at the same time as we adopted a greater measure of that planned economy in effort and expenditure which was the keynote of rationalisation. He hoped, therefore, that what had already been achieved by the Chemical Council was only a beginning, and that in their further schemes they would be able to rely on the willingness of the members of the societies to meet and hammer out some scheme for the better administration and development of all three, with the avoidance of duplication of effort and of unnecessary expenditure of time and money which was involved. He felt sure that this could be done to the great benefit of chemistry and without any loss of individualism, whether corporate or personal, or of initiative for further development.

As an example of progress made through modern research and the application of science, Lord McGowan asked his hearers to consider for a moment the process in which his company had been interested—the production of petrol from coal. This was an achievement of which they were proud,

but he said without qualification that the results which they had attained could not have been reached by the efforts of any single individual however brilliant. They had been obtained by a prodigious amount of patience and team work, not only on the part of chemists, but of metallurgists, physicists, instrument makers, heavy engineers and so on and so forth.

However much we could point to our advances in the past having been achieved by the efforts of individuals, by brilliant improvisation or flashes of genius or any other of the glowing terms by which we referred to "the good old days," we had now, whether we liked it or not, entered into an age of co-operation and committees. If you bore in mind the complexity of modern life, and the contraction which the world had suffered through the enormous acceleration in communication, it would be realised that we found the world was too uncomfortably overcrowded to allow elbow room for the swaggering individualist who tried to shoulder his way through the crowd.

Increasing Necessity for Research

Turning for a moment into other fields, if it took so many types to produce a large scale industrial achievement, how much more necessary was co-operation in the affairs of nations, in which you had all the combustible elements arising out of differences of race, national characteristics, jealousies, fears, inhibitions and ambitions.

He would have liked to have talked in more detail on the necessity for research, but the time at his disposal did not permit. In a word he would say that it was becoming more and more necessary that industry in this country should be research minded. Much had been accomplished in this direction during the last few years, but research must be prosecuted more and more if we were to keep our place in the forefront of industrial nations. All research organisations, private or public, must recognise that in some directions they would lose money. One could not back a winner every time. Consistent organised studies in the field of research, while they might sometimes be disappointing because an objective was not reached, were often of great value in other directions, and it was up to us to take advantage of every opportunity vouchsafed to us by science. He would plead for still more vision, courage and fortitude on the part of industrial and research organisations to tackle research in its broadest aspects and with what, he was sure, would be commensurate results.

He coupled this toast with the name of his friend, Professor Donnan, who until recently had adorned the Chair of Chemistry at University College. Professor Donnan had had a very considerable influence on the chemical industry in this country. Many of the men now directing the industry were still inspired by training they had received in his laboratory, and he supposed no professor in this country had sent out more recruits to industry.

The President's Response

Professor F. G. DONNAN, the President, responding to the toast reminded the company that when the Chemical Society first went to the provinces for their meetings, it was Manchester with which they had begun. He pointed out that the Society represented the great body of research in this country, and that Lord McGowan's company had spent something like £900,000 on research laboratories in the universities. As far as he knew from his experience at University College, this was an enormous advantage to research. The Chemical Society was certainly flourishing; as regards the library, which would very shortly reach bursting-point, definite steps were being taken to find a new home for what was the greatest library possessed by any chemical organisation in the world.

In proposing the toast of "The Guests," Professor I. M. HEILBRON made particular reference to the Lord Mayor and Lady Mayoress of Manchester, the Medical Officer of Health, the Town Clerk, and the Bishop of Manchester, Dr. F. S. G. Warman. Paying a tribute to Lord McGowan, he said that his interest in chemistry was a deep one, and it was a matter for pride that they had in Manchester one group of his companies—the British Dyestuffs Corporation. Among others to whom reference was made in the speech were:—Mrs. H. S. Butterworth, Mr. P. Caldwell, Mr. John Crompton, Sir Robert Pickard, Sir Robert Robertson, Sir Gilbert Morgan, Professor W. H. Roberts, Dr. A. P. M. Fleming, and Mr. C. Augustus Carlow. Dr. Fleming replied on behalf of the guests.

Others present included:—Mr. W. A. S. Calder, Mr. T. E. Grant, Professor M. W. Travers, Mr. E. J. Addyman Gardner, Dr. J. Vargas Eyre, Dr. Norman Smith, Professor G. Barger, Dr. G. N. Burkhardt, Professor F. Challenger, Professor J. E. Coates, Professor J. W. Cook (hon. secretary), Dr. C. W. Davies (hon. secretary), Dr. H. J. T. Ellingham (hon. secretary), Professor W. F. Garner, Professor C. S. Gibson, Professor J. Masson Gulland, Dr. T. A. Henry, Professor T. Campbell James, Professor J. Kenner, Professor F. S. Kipping, Dr. A. Lapworth, Mr. Emile Mond (treasurer), Professor T. S. Moore, Professor M. Polanyi, Mr. J. Davidson Pratt, Professor R. Robinson, Dr. E. H. Rodd (chairman and treasurer, local committee), Professor F. M. Rowe, Professor N. V. Sidgwick, Professor J. L. Simonsen, Dr. R. E. Slade, Professor J. F. Thorpe, and Mr. S. E. Carr (assistant secretary).

Resinous Products from Molasses

Utilisation as Road-Surfacing Material

THE Imperial Institute of Sugar Technology at Cawnpore, India, has for some time been engaged in experiments for converting molasses into an insoluble resinous product suitable for use as road-surfacing material, and the success of the experiments has now been fairly achieved.

The improved process of manufacturing the composition consists in carrying out the resinification of molasses with a mixture of coal tar and asphalt in the presence of acids such as sulphuric acid. The carbohydrates contained in molasses combine with the phenolic bodies contained in asphalt and coal tar to form a resinified compound, insoluble in water. It is said to satisfy the following conditions: (1) It is completely liquid at the time of application; (2) after being spread on the road, it does not melt in hot weather; (3) it is not worn away by heavy traffic; and (4) it is cheaper than other asphalt preparations on the market.

The success of the manufacturing operation depends upon the removal of the last trace of moisture from the molasses before mixing with the other ingredients. Waste molasses are concentrated in an iron pan with constant stirring until the temperature reaches 135° C. with progressive thickening. Dilute sulphuric acid corresponding to 1 per cent. of the weight of concentrated molasses, is added slowly and heated until the temperature rises further to 210°-230° C. A mixture of asphalt and coal tar is melted in a separate pan fitted with mechanical stirrers and is treated with dilute sulphuric acid. The treated molasses is then gradually incorporated in the acidified liquid asphalt and coal tar mixture, the stirrers running constantly. When the requisite proportion has been added, the heating is continued until the test samples show absolute insolubility in water. The product is obtained in a pasty condition, easy to handle and suitable for application mixed with stone chips. The top surface of the molasses tarmacadam composition sometimes shows signs of peeling off at the surface after two or three months, unless a suitable smooth seal coating material is applied. A good seal coating material is prepared by dissolving the molasses-asphalt-coaltar composition in the proportion of 1 lb. to 1 gallon of coal tar. The seal coating material is quite liquid and easy to apply to the road surface.

The road composition and the seal coating material are the subject of an Indian patent.

THE production of thiokol, and of plastics from naphthalene, is contemplated by the firm of Ludwig David (Hungary).

Chemical Matters in Parliament

Oil from Coal—The Caledonian Power Bill Second Reading

Oil from Coal

LORD AILWYN, in the House of Lords on Wednesday, drew attention to the Report of the Sub-Committee on Oil from Coal, and asked his Majesty's Government what steps they were contemplating to implement the recommendation in that report. So far as he could see, the situation of our oil supply in the event of war was not one whit more satisfactory than when he last addressed the House on this matter.

We were facing a number of grave risks in our continued dependence on foreign imported oil, and in the precariousness of our supply at the source. Yet all these risks the Government were apparently prepared to accept. The Falmouth Committee recommended the continuance of a guaranteed preference on home-produced spirit for a period of 12 years, the rate being increased from 4d. to 8d. a gallon and the guarantee extended to include Diesel oil for use in motor vehicles. It was to be hoped that the Government would accept this very desirable provision and announce their decision as soon as possible.

He wished to consider the broad aspect of the case of those processes in the country which were not examined by the Falmouth Committee. That Committee considered they could not investigate the claims put forward in respect of a number of processes which had not been developed beyond the laboratory stage. He suggested that such principles should not have been so rigidly applied as to cause injustice to individual deserving cases.

In 1934 the then Chancellor of the Exchequer announced that in no circumstances could any further money be found for, among other things, oil from coal processes, unless and until the written approval of the Government experts had been obtained. Those Government experts, in the shape of the Fuel Research Board, had laid down that a written report could not be given on any plant which was not operating commercially. One company he knew of had far-reaching claims and they made repeated requests that their claims might be heard. They were completely unsuccessful and the Falmouth Committee reported to the Government without hearing what that company had to say. There had been a misunderstanding which had now been removed. He was hopeful that the country would in due course benefit as a result. It was the kind of case that should have been examined by the Falmouth Committee. His information was that there were other cases which had been ignored in the same way. If the Committee had devoted more time to investigating some of these cases they would not have given so much time to investigating wholly uneconomic processes such as low-temperature carbonisation and hydrogenation. He had faith in the eventual evolution of a process of producing oil from coal. There had to be energy, enthusiasm, and drive. No claim should be ignored however apparently fantastic.

LORD TEYNHAM, in supporting Lord Ailwyn, said that the figures disclosed by the oil interests showed that the reserves were astonishingly low. Exhaustion was possible within the next 20 years.

EARL DE LA WARR, Lord Privy Seal, said that the question which had been raised was one of vital necessity in time of war and of very great peace-time importance also. Lord Falmouth had placed the country under a deep debt of gratitude for the work he had done. The Falmouth Committee did not refuse to consider any processes which it was possible for them to consider. There was a tremendous gap between a process which had been examined in a laboratory and a process which had reached the factory stage.

The Fuel Research Board existed and was in a position to examine processes at a very early stage, and hitherto it had been laid down that that stage must be such as to make it possible to draw economic conclusions from the process. The processes indicated by Lord Ailwyn had not reached that stage. The Government had the whole question under very serious consideration. At the present time we were producing about 7 per cent. of our requirements and that was only by means of a preference of no less than 8d. a gallon. The Government were not looking at this matter from a purely economic point of view, because they had already given that assistance, and they were at present seriously considering the recommendations of the Falmouth Report. He could reassure Lord Ailwyn that the position was certainly better than it was when the noble lord raised the question a few months ago.

LORD AILWYN said he was extremely glad to have the assurances which the Lord Privy Seal had been able to give.

The Caledonian Power Bill

On the order for the second reading of the Caledonian Power Bill in the House of Commons on Wednesday, Sir M. MACDONALD moved the rejection. He said that whatever scheme was adopted must have a detrimental effect on the River Ness, and the town of Inverness had therefore a vital interest in the Bill.

Mr. DAVIDSON, in supporting the rejection of the Bill, said that from the national point of view the industry in question was best suited for a distressed mining area. The Bill would stop the natural development of industry in the Highlands. An area of 300 miles, four important lochs, and 37 other lochs and rivers would be affected. All this to employ 300 people.

Mr. BOOTHBY said that he hoped the House would give a second reading to the Bill. It was idle to suggest that it was cheaper to produce calcium carbide by coal. In default of any constructive alternative the Bill offered the best hope of bringing some revival to the West of Scotland. During the period of construction between 3,000 and 5,000 men would be employed, and thereafter between 300 and 500 permanently at the factory. Electricity would be supplied at cost price within the whole area covered by the scheme.

SIR THOMAS INSKIP, Minister for Co-ordination of Defence, said that two articles would be manufactured at Corpach and Port Talbot—calcium carbide and ferro-alloys. It was only at Corpach where the cost of electricity would be low enough to allow the ferro-alloys to be manufactured. At Port Talbot it would be entirely calcium carbide. It was in connection with calcium carbide and ferro-alloys that the Defence aspect rose. Calcium carbide was consumed in this country at present up to a volume of about 60,000 tons. It was on the increase and was essential for fabricating a number of indispensable articles, especially in war time. If this Bill or some similar Bill was not passed and an industry established, it would be necessary in war time for shiploads of something like 1,000 or 1,200 tons every week to come from Norway to supply this vital necessity. We were the only important nation in Europe that did not at present manufacture calcium carbide for ourselves. Ferro-alloys were required in large quantities. Ferro-chrome had to be imported to the tune of 18,000 tons last year and 37,000 tons of ferro-silica. It was required for high-grade steels of particular hardness or tensile strength. At present we were dependent for its manufacture on Germany. The raw materials were obtainable largely from the Empire, but they were taken to Germany and there manufactured. He suggested that it might be better that this manufacture should take place in this country.

The House divided, when there voted:—for the rejection 227, against 141.

Death of Sir Henry Sutcliffe Smith

A Dye and Colour Expert

THE death occurred last week at Cannes of Sir Henry Sutcliffe Smith, the president of the Colour Users' Association and executive director of the Bradford Dyers' Association, at the age of 74.

He was born at Halifax, educated at Mill Hill School, London, and subsequently entered the dyeing firm of Edward Ripley and Son, Ltd., of Bradford, of which his uncle, the late Mr. H. Ripley, was a partner. He eventually became managing director of the company and on amalgamation with the Bradford Dyers' Association, he was appointed an executive director of the larger organisation.

Sir Henry probably entered upon his most important work after the War. In 1921 he became chairman of the Colour Users' Association, which chairmanship he retained until November of last year, when he was elected president of the association. In 1922 he was appointed by the President of the Board of Trade to a position on the Advisory Council of the Board and in 1924 he became a member of the Dyestuffs Advisory Licensing Committee which played such an important part in establishing and developing the dyestuffs industry in this country. In the following year he joined the Dyestuffs Industry Development Committee.

In addition to his activities in the dyestuffs industry he made important contributions to the commercial activities of Bradford. He was elected to the Council of the Bradford Chamber of Commerce in 1911 as an acknowledgment of his work in organising the Bradford exhibit at the Brussels Exhibition held in the previous year. This exhibit, which illustrated the various processes of converting raw wool to the finished fabric was most successful and the Belgian Government made a special award to Sir Henry on this account. He was president of the Bradford Chamber of Commerce from 1919-1921, during the time that an international arbitration scheme for the wool textile industry was established. This scheme subsequently developed into the present International Wool Textile Organisation. In recognition of this work, France conferred on him the honour of Chevalier of the Legion of Honour in 1927. Sir Henry had also been president of the Society of Dyers and Colourists, and a member of the British Colour Council, British Institute of Industrial Art and Bradford Textile Society. He was greatly interested in a number of charitable organisations, outstanding among which was the Royal National Lifeboat Institution. He was chairman of the Bradford branch of this organisation. He was knighted in 1929 and is survived by his wife, one son and two daughters.

Sir Henry Sutcliffe Smith.

Analysis of Mixed Carbonates

An Improved Method Suggested

IN a paper presented before the Academy of Sciences by Marcel Delepine, M. Georges Wolf suggests an improved method for determining the amounts of each of the carbonates of calcium, strontium and barium, existing in a mixture of the three.

The method he proposes is to heat the mixture in a vacuum, and then measure the pressure of CO_2 produced by the decomposition. Heated in a vacuum, the calcium carbonate will decompose at 630°, strontium carbonate at 840° C., and barium carbonate at 1,200° C. His tests were made on 310 mg. of material, consisting of 128.5 mg. of calcium carbonate, 112.6 mg. of strontium carbonate and 68.9 mg. of barium carbonate. The mixture was heated in a Hackspill and Kieffer apparatus to a temperature of 1,200° C., the time required to reach this temperature being two hours. On the pressure indicator of the apparatus he obtained a pressure of gas of 5.7 mg. of mercury in three clearly defined steps, each step being separated from the other by a long period of steady pressure, while the temperature passed from the decomposition point of the one substance to that of the next.

Knowing the volume of the apparatus it was then possible to calculate the weight of the gas and hence the percentage of each of the carbonates in the mixture.

Coal Utilisation Research

An Assured Income for Five Years

AT the fifth annual luncheon of the Combustion Appliance Makers' Association, held at the Dorchester, Park Lane, on March 30, it was announced that the British Coal Utilisation Research Association had been formed with an assured income for five years of between £25,000 and £30,000 a year, supported by the coal trade and by a grant from the Government.

LORD FALMOUTH said that last year between 180,000,000 and 190,000,000 tons of coal were consumed in appliances which interested the association. If the industry was to maintain its output the efficiency of combustion apparatus had to be improved.

The PRESIDENT (Mr. J. A. Reavell) said that on the effectiveness and suitability of their appliances depended the cost of heat and power. In 1910 the consumption of coal per head was 4.34 tons, while in 1934 it was 3.58.

Sir FRANK SMITH said that their greatest material asset was the fact that they had more than 100,000,000,000 tons of coal in Great Britain, enough to last for 500 years. The way in which the problem was tackled would largely affect the industrial future of the country. Domestically 40,000,000 tons of coal were burned each year and 2,500,000 tons of soot came into the atmosphere to do untold damage to health and vegetation. Industrially 800,000 tons of soot were poured out.

Further Growth of Sales of I.C.I. Products

Satisfactory Trade in 1937 shown by the Company's Annual Report

THE annual report for the year 1937 of the Directors of Imperial Chemical Industries, Ltd., to be submitted at the eleventh ordinary general meeting to be held on April 21, states that during the year the national prosperity, referred to in the last report, continued, with further growth in the company's sales of nearly all products. In many cases new records were established. A comparison of monthly sales during 1937 with those of the corresponding months of 1936 shows that while the rate of increase was not so great during the last few months of the year as during the early part, nevertheless there were only a few products which showed decreases.

Export Trade Generally Good

Notwithstanding the interruption of the normal development of business by political disturbances, export trade was generally good, the company's business improving particularly in those markets which are largely dependent on the price of primary products.

In the early part of the year sales in China were promising, but not unnaturally the outbreak of hostilities brought business almost to a standstill. In Japan, monetary stringency led to exchange control, and later to the economic restrictions arising out of war conditions. Imports on any appreciable scale became impossible in the latter part of the year. On the other hand, Japanese export competition, which remained acute up to the middle of the year, gradually diminished in the second half. Provincial autonomy in India was introduced with unexpectedly little difficulty. Business has been good and sales reached high figures. To meet the needs and aspirations of the market the company has taken steps to register "The Alkali and Chemical Corporation of India, Limited," which will have its first factories in the Punjab and Bengal. In the Near East the continued industrialisation of Turkey resulted in an increasing demand. Political uncertainty has hampered trade in Palestine and to a lesser extent in Syria and Irak, in which markets it has been possible to do little more than maintain the company's position. Despite the continuance of the Civil War, a limited amount of agricultural and industrial business has been done in Spain.

The general high level of industrial production in the British Isles was reflected in the deliveries of products of the Alkali Group, which again exceeded those of the previous year. The higher demand was largely the result of expansion of activity in the glass, rayon, soap and paper industries, although there was also a bigger offtake in the general trade. A recently introduced modification of blast furnace technique which necessitates the use of sodium carbonate in the desulphurisation and refining of crude iron, has opened up a promising new market. Experimental work on a large scale for the production of activated coke by the addition of sodium carbonate to the feed to gas-ovens gives promise of another substantial outlet. In 1937 the sale of soda crystals in packets, which was started during 1936, was extended over the whole of the United Kingdom with favourable results. Sale of the smaller tonnage products, such as sodium aluminate and special bottle-washing detergents, have shown a satisfactory growth.

Business in the Dyestuffs Group continued to increase during 1937, both in the home markets and foreign. Many new products were introduced during the year and the range of synthetic resins has also been further augmented. Considerable capital expenditure has been incurred on buildings and plant to provide for expansion in business and the manufacture of new products.

In the Explosives Group the Ardeer factory achieved a high production of industrial explosives arising from the heavier demand from the gold mining industry abroad and the increased activity of the coal industry at home. The activity of the group in non-explosive products made steady progress.

The consumption of fertiliser nitrogen in the home market in 1937 remained about the same as in 1936. The Fertiliser and Synthetic Products Group, selling also the by-product sulphate of ammonia produced by members of the British Sulphate of Ammonia Federation, again supplied about 70 per cent. of the demand. Export sales of fertiliser nitrogen surpassed those of the preceding year.

The hydrogenation (petrol) plant has run throughout the year; operation has been much steadier and mechanical difficulties encountered during the earlier years have been overcome. As a result of the year's operations, 117,000 tons, or 35 million gallons of petrol were produced, all of which was distributed by the Anglo-American Oil Co. and Shell-Mex and B.P. Co. Included in this output were some 2 million gallons of aviation spirit complying with the latest specification, viz.: 87 octane number. The percentage yield of petrol obtained per ton of coal treated was improved.

Sales of the general chemical group on the whole were in advance of those of 1936. Deliveries of chlorine and chlorine derivatives were considerably increased. The demand for acids was at a high rate in the early part of the year, but there was some slight diminution in the latter months.

In the Leathercloth Group, sales advanced beyond those of 1936 in the home market, which absorbs the bulk of the production. Satisfactory results have been obtained in export markets, where sales rose substantially.

Sales of Buxton lime this year again exceeded those of previous years. Deliveries to the steel trade showed the greatest expansion, but in the closing months the agricultural demand responded sharply to the stimulus of the Land Fertility Scheme, with the result that orders outran the capacity of the industry. Business in cement and plaster showed improvement.

A marked increase in the normal trade of the Metal Group and exceptional Government demands combined to make 1937 a year of great activity. But for the policy of rationalisation and modernisation which has been steadily pursued over a period of years it would have been difficult to deal with this situation. The expansion in home sales of metal extended to all products, but was particularly evident in tubes, rods and wire. There has also been a rapid increase in sales to the aircraft industry of rolled light alloys, the manufacture of which was begun during the year. Export sales of metal recovered towards normal, largely owing to increased activity in India and an improvement in South American business.

The Paint, Lacquer and Plastics Groups

Once again the Paint and Lacquer Group achieved excellent sales in paints, varnishes and cellulose finishes for a large variety of industries and for decorative purposes. Turnover of the Plastics Group during the year increased materially. Activity in the moulding and allied trades was marked and the group obtained its proportionate share in the growing market. The new centralised factory, at Welwyn Garden City, to which reference was made in the last report, is now in course of construction, and most of it should be in operation in the autumn of 1938. A trade of such variety and with so many potentialities as the plastics industry has called for a vigorous research policy both to improve existing products and to initiate new developments, and good results are expected from the expenditure involved.

The company's activity in research has continued and new laboratories have been opened at Blackley, Manchester, for the Dyestuffs Group, and at Witton, Birmingham, for the Metal Group. New laboratories are also under construction at Hyde, Manchester, for the Leathercloth Group, and at Slough for the Paint and Lacquer Group.

The number of employees in the factories and offices of the company in Great Britain is approximately 61,600, as compared with 56,000 a year ago.

In Honour of Benjamin Franklin

Memorial to be Dedicated at the Franklin Institute

ONE of the finest and most appropriate memorials in the United States will be formally dedicated on May 19, 20 and 21, 1938, at Philadelphia, to the memory of Benjamin Franklin.

A statue in white marble of the great eighteenth century scientist and statesman will be unveiled on May 19 in a memorial room in the Franklin Institute. The President of the United States has expressed his intention to unveil this statue, and British and French ambassadors and the Canadian Minister will honour the statue by placing wreaths at its foot, thus emphasising the world-wide esteem in which Franklin's memory is held. The statue is being executed by the noted American sculptor, James Earle Fraser. It will be a seated figure, approximately twice life-size, showing the subject as he appeared in the latter part of his life. The all-marble memorial room, which was inspired by the Pantheon at Rome and will contain nothing other than the great statue, will be the spiritual centre of the classic structure on Benjamin Franklin Parkway, where the Franklin Institute houses its Fels Planetarium and its unique "Wonderland of Science" museum, where more than 4,000 action exhibits reveal the part played by science in everyday life.

The Franklin Institute was organised in 1824 for "the promotion of science and the mechanic arts," and named after Benjamin Franklin, who was the outstanding American protagonist of such aims. In his will Franklin bequeathed £1,000 as a trust fund for the use of Philadelphia in aiding young artisans, and a like sum to Boston, Mass., his birthplace, for the same purpose. A part of the fund thus created in Philadelphia was at one time turned over to the Franklin Institute as a portion of its endowment. Thus Benjamin Franklin himself is one of the financial contributors to the institution which is carrying on the work in which he was so keenly interested and which will be the home of his new memorial.

The programme for the three days of dedicatory ceremonies has been so arranged that different aspects of the character of Benjamin Franklin will be emphasised on each of the three days. The theme of the first day, May 19, when the statue will be unveiled, will be "Franklin, Patriot and Man." On the following day, May 20, he will be honoured as "Philosopher and Educator," and on May 21 as "Printer and Business Man." Outstanding scientists and educators of two continents will participate in an all-day programme dealing with the pure sciences at the Franklin Institute on May 20. On the list of speakers are Sir James C. Irvine, principal and vice-chancellor of the University of St. Andrew's, Aberdeen, Scotland, where the degree of Doctor of Laws was conferred upon Franklin in 1759; Dr. Louis Martin, director of the Pasteur Institute, Paris; Dr. Gilbert N. Lewis, dean of the College of Chemistry of the University of California; and Dr. C. E. K. Mees, director of the research laboratory, Eastman Kodak Co., Rochester, N.Y.

One of the many public-spirited activities of Benjamin Franklin for the betterment of Philadelphia was the founding of an academy. This school has grown into one of the larger American institutions of learning, the University of Pennsylvania. On the evening of May 20 this University will confer degrees and the Franklin Institute will award medals at the foot of the statue in Franklin Hall. "Science in Business and Industry" will be the theme of a second meeting to be held at the Franklin Institute on Saturday, May 21. It will be attended by representatives of national engineering and professional societies. Addresses will be made by Dr. Harvey N. Davis, president of the Stevens Institute of Technology, Hoboken, N.J.; Dr. Willis R. Whitney, vice-president in charge of research, General Electric Co., Schenectady, N.Y.; and Dr. W. E. Wickenden, president of the Case School of Applied Science, Cleveland, Ohio.

Benjamin Franklin made important investigations in many fields of science, but it was chiefly through his electrical discoveries that he became an international figure. He was the first electrical experimenter to use the terms "positive" and "negative," which cleared away archaic laboratory jargon and was a most important step in establishing on scientific basis the recording of the study of electrical phenomena. For his discoveries in electricity he received a personal letter of thanks from Louis XV, king of France, and the Royal Society of London awarded him its Copley gold medal. His "Experiments and Observations on Electricity" were published in many editions and translated into nearly all European languages.

Safety First Council

Lord McGowan at Annual Dinner

LORD McGOWAN, chairman of Imperial Chemical Industries, Ltd., was the chief guest at the annual dinner of the Manchester Industrial Safety First Council Committee on March 4.

Mr. L. E. Mather, chairman of the Council, who presided, pointed out from the annual report that the accident returns for the 66,500 employees of the 98 member-firms of their area showed 2,869 lost-time accidents in the year, and 42 per cent. were from handling objects, falling objects, or falling over objects, and only 15 per cent. were from machinery.

Lord McGowan, as president of the National Safety First Council, said an increasingly large section of industry welcomed factory legislation, and regarded the factory inspector as a friend. A similar bill to that which became the Factories Act of 1937, slightly less stringent if anything, was introduced in 1926 and did not become law. Bills of this kind did not become law until the majority of the provisions were being carried out voluntarily, and the N.S.F.A. had done a great deal to bring this about.

Lord McGowan presented shields and medals for the area ambulance competitions. The "Ferranti" shield for the junior section was presented to the team from Messrs. Wiggins, Teape, and Co. (1919), Ltd.

Ten Years Back

From "The Chemical Age," April 7, 1928

Professor Theodor Zincke, the eminent German chemist died at Marburg, on March 17, aged 84. From 1875 till his retirement in 1913 he was professor at the University of Marburg.

* * * *

Egyptian imports of chemicals, medicinal products and perfumery in 1927 were valued at £E.3,538,281, and exports at £E.301,797. Dyestuffs, colours and tanning materials were imported to the value of £E.369,723, and exports were valued at £E.26,122.

* * * *

Sales of nitrate of soda reported by the Producers' Association during the fortnight ended March 15 amounted to 55,750 metric tons for shipment up to June, 1928, and to 46,369 metric tons for delivery in the 1928-29 nitrate year. Total sales of the fertiliser since the introduction of free selling on April 14, 1927, up to March 15, 1928, were 3,078,148 metric tons (including 232,336 tons disposed of for delivery in 1928-29). It is understood that further sales of the fertiliser have been effected during the past fortnight at prices ranging from 16s. 6d. to 16s. 9½d. per metric quintal, according to delivery dates.

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Micro-electrolytic determination of copper in presence of other metals. Lindsey, *Analyst, 63,* 159-162.

Analysis of chromite. van der Walt, *Analyst, 63,* 176-179.

Analysis of gasoline. Thomas, Bloch and Hoekstra, *Ind. Eng. Chem. analyt. ed., 10,* 153-156.

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Electrical coking of coals. Stevens, *Brennstoff Chem., 19,* 87-92.

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Cellulose, Paper

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Adsorption of salts on methylcellulose. Heymann, Bleakely and Docking, *J. Phys. Chem., 42,* 353-368.

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Chemical decomposition of wood. v. Wacek, *Z. Papier Pappe Zell. Holzstoff, 56,* 27-36.

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Metals, Electrometallurgy

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Causes of corrosion. Samson, *Zellstoff u. Papier, 18,* 113-116.

Fats, Oils, Waxes

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Purification of animal and vegetable oils and fats. *Matières Grasses Pétrole et Dérivés, 30,* 63-64.

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Natural resin technology. Skeet and Allen, *Paint Varnish Prod. Manager, 18,* 94-96.

Oil soluble resins for paints and varnishes. Bowman, *Paint Techn., 3,* 64.

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Advances in the paint industry. Matagrin, *Rev. Chim. Ind. Quesneville, 47,* 44-52.

Aluminium paste pigment. Parkinson, *Oil Colour Trades J., 93,* 962-968.

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Manufacture of synthetic rubber from ethyl alcohol. Nebovidsky, *Bull. Assoc. Chim., 55,* 215-228.

Transformation of mercaptobenzothiazyl sulphide. Zéide and Petrov, *India Rubber J., 95,* No. 14, 9-11.

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Artificial leathers. Thiollet and Agrapart, *Rev. Chim. Ind. Quesneville, 47,* 34-44.

Chlorinated rubber in plastics. Daubigny, *Rev. Générale Matières Plastiques, 14,* 17-20.

Miscellaneous

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Fireproof building materials. Rasch, *Chem. Ztg., 62,* 193-196.

Harmful copper and iron in dry batteries. Drotschmann, *Chem. Ztg., 62,* 216-218.

A new nitrogenous fertiliser, "Ammotorfol," is to be produced on a semi-technical scale in Russia, the essential operation being treatment of peat with ammonia liquor from gasworks and then with ammonia.

Personal Notes

MR. C. L. BIRD has been appointed lecturer in dyeing at Leeds University.

THE LATE MR. ALEX. DAY, F.R.S.E., retired, manufacturing chemist, of Corstorphine, Edinburgh, left estate valued at £26,553.

SIR WALTER BENTON JONES has been appointed a director of Shireoak Colliery Co. He is chairman of the United Steel Companies.

THE LATE LORD RUTHERFORD OF NELSON, who was Cavendish professor of experimental physics at Cambridge University, left estate valued £7,402 with net personalty £6,231.

THE LATE LT.-COL. HENRY ARTHUR PRATT, R.A., of Parkstone, late chief of the Investigation Department at Woolwich Arsenal, left estate valued £29,615 with net personalty £20,442.

MR. F. H. WYNNE, H.M. Chief Inspector of Mines, has been appointed a member of the Explosives in Mines Research Committee in place of Sir Henry Walker, who has retired from the public service.

THE LATE MR. JOHN POYNTER MILLER, of Heathcote, near Aberdeen, who was chairman of John Miller and Co., chemical manufacturers, and a director of Scottish Agricultural Industries, Ltd., left personal estate valued at £109,866.

LIEUT.-COMMANDER A. E. HORRELL, R.N., who has been at the Admiralty Chemical Defence Experimental Station for three years, has been appointed Air Raids Precautions Officer for Norwich, subject to the necessary arrangements being made for him to retire from the Admiralty.

MR. GUSTAVUS HENRY LATHAM has succeeded the late Mr. Lionel D. Whitehead as chairman and managing director of the Whitehead Iron and Steel Co., Ltd., of Newport, Mon. He joined the company as office boy thirty-three years ago, and since 1931 had been deputy-chairman and general manager. He is a director of British Iron and Steel Corporation, Ltd.

MR. P. D. WESTON, managing director of the Olympia Oil and Cake Co., Ltd., of Selby, has been appointed a managing director of the British Oil and Cake Mills, Ltd., of Hull and London. In addition, Lever Bros. and Unilever, Ltd., have appointed Mr. Weston as the head of their newly-formed technical advisory department at the Selby mills. Mr. Weston is the patentee of several types of oilseed crushing machinery.

MR. SYDNEY STANSFIELD, who has been with the Oxley Engineering Co., Ltd., since its inception, has been appointed to the position of chief technical engineer. MR. GEORGE BELL, late of Ride and Bell, Ltd., has joined the staff, and will be in charge of coal, coke and oxide handling plant. MR. FRED GARNER, who served his apprenticeship with R. and J. Dempster, Ltd., of Manchester, and who was with the Sturtevant Engineering Co., Ltd., for 14 years, has been appointed sales manager.

MR. SIMON A. A. N. MAAS, managing director of the Industrial Alcohol Co., which controls the five new alcohol factories erected in Eire during the last three years, has resigned. Mr. Maas, who is a native of Schiedam, Holland, was appointed under the Industrial Alcohol Act, 1934, with a salary of £1,800 per annum, and he gave the assistance of considerable experience in Europe in the production of industrial alcohol to the Irish firm. At the time the project was undertaken an agreement with the Department of Industry and Commerce provided that Voury and Vander Lande, of Deventer, Holland, the firm who advised on the technical questions concerning the factories, would appoint the managing director of the company for five years after the installation had begun to operate. It is understood that DR. GERRIT VAN DER LEE has been appointed managing director in succession to Mr. Simon A. A. Maas.

MR. PETER F. BENNETT, O.B.E., J.P., was elected president of the Federation of British Industries for the coming year, in succession to Lord Hirst, at the annual meeting of the Federation on Wednesday.

MR. GEOFFREY C. GIBBS, of Holwell Manor, Hatfield, Herts, chairman of the Sulphide Corporation, Ltd., has been appointed a director of the L.N.E.R. in succession to the late Sir Charles Albert Batho. Mr. Gibbs is a director of the Bank of Australasia.

LT.-COL. J. H. M. GREENLY, C.B.E., has accepted the invitation of the Council of the Institute of Fuel, to become President of the Institute in succession to Sir Philip Dawson, M.P., on October 13 next. Colonel Greenly, who has been a vice-president of the institute for the past few years, is the chairman of Babcock and Wilcox, Ltd.; he is also a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research; the chairman of the British Non-Ferrous Metals Research Association; chairman of the Coal Burning Appliance Joint Consultative Board, and vice-president of the Combustion Appliance Makers' Association (Solid Fuel), besides being concerned with other technical and commercial bodies.

Lt.-Col. J. H. M. Greenly.

SIR ROBERT MOND, well-known for his interest in excavations in Egypt and Palestine, has organised an expedition, this time on behalf of the Institute of Archæology, Liverpool. The expedition will conduct exploratory soundings for one month at the town of Tell Atrib, the classical Athribis, 30 miles north of Cairo.

Foreign Chemical Notes

Jugoslavia

THE BATU CO. is to commence motor tyre manufacture at Borovo, near Vukovar.

Poland

STAPLE FIBRE IS NOW BEING MADE under the name of Chostra by a new factory at Chodakov, near Warsaw.

Dutch Indies

THE SINGAPORE RUBBER WORKS propose to build a gasmask factory in Java, and have entered into negotiations with the War Ministry.

PROCESSES FOR MAKING NEARLY PURE RUBBER POWDER from latex, and for utilising rubber-asphalt mixtures in roadmaking, have been developed by the West Java Research Institute.

From Week to Week

The Chemical Age Lawn Tennis Tournament

Entries Close May 3

Entries for THE CHEMICAL AGE Lawn Tennis Tournament, details of which were published last week, must be sent in by May 3 (first post). The tournament, for which there is no entrance fee, comprises men's singles and doubles, open to members of the chemical industry throughout Great Britain, either as principals or members of staffs. THE CHEMICAL AGE silver challenge cups are held by the winners for twelve months, and statuettes are presented outright to the winners and runners-up.

Immediate application should be made for full particulars and entry forms to The Editor, THE CHEMICAL AGE, Bouverie House, 154 Fleet Street, London, E.C.4. (Telephone: Central 3212).

WHILE WORKING AT A CUTTING-UP MACHINE in Carnoustie chemical works, Charles Haggart was struck in the back by the moving knife and received cuts and bruises.

LARGE QUANTITIES OF NAPHTHALENE were burnt in a fire which broke out in the premises of the British Tar Products Co., Ltd., at Cadishead, near Manchester, on March 30.

DAMAGE ESTIMATED AT £3,000 was caused by a fire which broke out in the sanitary pipe department at Ellistown Brick, Pipe and Fireclay Works, Leicestershire, on March 31.

THE TRUSTEES FOR THE HOLDERS of Dutch certificates of the 6 per cent. debentures of British Bemberg, Ltd., are calling a meeting to discuss the company's position following the decision of the company not to pay the coupon which fell due on December 31 last.

MR. EVAN RICHARD WILLIAMS, of Ogmore-by-Sea (Glamorgan), a volunteer taking air-raid precautions training, has died as a result of attending an anti-gas demonstration. He was one of twenty-four persons who attended the demonstration. A tear gas was used. The party entered a Home Office gas van in groups of six.

THE MEXICAN EAGLE OIL CO. have been refused an injunction against the Mexican Government from collecting tax amounting to some £150,000 claimed as an impost on funds the company had sent abroad. The tribunal held that the Mexican Eagle Oil Co. were liable to this tax, which amounts to 4 per cent. on all exported money.

CROSSLEE MILLS HELD A SUPPER in Johnstone last week, which was attended by nearly all of the staff and workers. Mr. Gordon Carr, works manager, proposed the toast of I.C.I., Ltd. Mr. Leonard H. Swinbank, Controller of Purchases for I.C.I., Ltd., replied, and referred to the importance of cotton to I.C.I., and the many uses to which it was put throughout that undertaking.

A DECISION TO RESIST PRICE-CUTTING was reached at a private meeting of the English China Manufacturers' Association at Longton, Staffs. It was decided to maintain prices at the present levels, which include an increase of 20 per cent. added during the past year or two. The recent break-up of the Earthenware Association in the potteries has given rise to fears of a price war among the former members.

A NEW METHOD OF CONVEYING EDIBLE OILS in bulk by road-rail transport was demonstrated at Euston station last week, when the first unit of a fleet of eight railway wagons, each designed to carry two insulated and electrically-heated road-rail tank trailers, was on view. This development, which will ensure the expeditious transport of edible oils from refineries to factories which are not connected by railways has been undertaken by the L.M.S. Railway, for the bulk conveyance of oils on behalf of Lever Brothers and Unilever, Ltd. The wagons and rail-road tanks have been built by the railway company in conjunction with R. A. Dyson, of Liverpool.

THE PAPER-MAKING INDUSTRY is taking a practical interest in the China Clay industry. For several years past the firm of Peter Dixon have acquired the Treskilling china clay works and the Bridges Moor china clay works. Since then Bowater's Paper Mills, Ltd., have successfully negotiated for the control of the Great Hawks Tor china clay works at Blisland, North Cornwall, and have not only increased the annual production, but have also considerably improved the process of production. The Inveresk Paper Co., Ltd., have come to satisfactory terms with the South Fraddon China Clay Co., Ltd., for the control of the South Fraddon China Clay Works near S. Columb. The South Fraddon china clay works are within about 60 acres of china clay bearing land in the Fal Valley clay zone, and it is understood that the Inveresk Paper Co., Ltd., intend to develop these works to the fullest capacity. Mr. Charles R. Skynner, of S. Austell, is the local director.

A NEW FACTORY BUILT FOR VITAMINS, LTD., proprietors of Bemax, to replace the one which was destroyed by fire last year, was opened by Mr. A. P. Herbert, M.P., on the riverside at Hammersmith, on April 1.

THE MANAGEMENT COMMITTEE of the International Steel Cartel held a meeting in Luxembourg on March 31. Discussion was chiefly centred round the question of the renewal of the cartel, and it was generally felt that a satisfactory arrangement would be arrived at in the near future.

BRITISH ELECTRO METALLURGICAL CO., LTD., has commenced operations at its new works at Wincobank, near Sheffield, where ferro alloys are to be manufactured. The first furnace to be put into operation is making ferro-chrome, for which British steel makers have hitherto been dependent upon supplies imported from abroad.

A NEW FACTORY FOR THE MANUFACTURE of structural cane fibre in all its forms in Great Britain is nearing completion at Stonebridge Park, Middlesex. The factory is being built by Celotex, Ltd., and its normal output will be about 12,000,000 square feet of hard board, and 30,000,000 square feet of insulation material per annum.

SIR FRANK STOCKDALE, agricultural adviser to the Colonial Secretary, attended a meeting of the Dutch Agricultural Syndicate, at The Hague, on March 30, when he stressed the necessity for closer co-operation between British and Dutch East Indies rubber interests in rubber research, now that the prolongation of the rubber restriction scheme is almost certain.

A SERIES OF INFORMATIVE BULLETINS on practical engineering measures for combating occupational disease is being issued by the Air Hygiene Foundation, of 4400 Fifth Avenue, Pittsburgh, Pa., a non-profit organisation for the advancement of industrial health. The first of the series deals with "Determination of Benzol Vapour in the Atmosphere"; the second covers the "Use and Care of Respirators." The bulletin on benzol vapour in the atmosphere, describes the procedure for taking samples and for their analysis, either by a volumetric or a colorimetric method.

THE INSTITUTE OF VITREOUS ENAMELLERS propose an official visit to the United States, subject to a sufficient number of applications being received. The visit will take place in October next; this month has been decided upon in conjunction with the Porcelain Enamel Institute of America, who are holding their annual conference and banquet during that month and have issued a very cordial invitation to attend. The party will leave England on the s.s. *Georgic* on October 1, and arrive back in England on the s.s. *Washington* on October 25. Full details will be available later.

CANADIAN MINERAL PRODUCTION in 1937 at $456,793,260 surpassed all previous records. Nearly every item in the entire mining list showed gain over 1936, the total value for that year being $361,919,372. Nickel production at $59,407,176 was 32 per cent. higher than in 1936; copper at $69,049,734 was up 75 per cent.; lead and zinc at $21,013,404 and $18,157,894 were higher than ever before; silver at $10,180,371 increased 23 per cent.; asbestos at 410,026 tons was a new high record; salt, sulphur, sodium sulphate and nepheline were also high records. Platinum metals were worth $9,933,709 compared with $7,803,806.

A TRAINING AND EXAMINATION SCHEME for works' managers has been established by the Works' Management Association and courses are now being prepared in a number of technical colleges in the principal industrial districts in this country. When time has elapsed for candidates to complete the curricula, entrance by examination will be the basis of membership. For a limited time, however, senior works' managers will be eligible without examination. The scheme is the result of the work of a Professional Standards Committee which has been taking evidence and pursuing researches for the past three years. The Works' Management Association was established seven years ago and is the only incorporated institution of works' managers in this country.

A NEW WATER SOLUBLE RESIN is announced by the Glyco Products Co., Inc., New York, under the name of Hydroresin A. This product is a light brown viscous liquid with high adhesive properties and is very slow drying. On the addition of water to Hydroresin A, it is said that no decrease in viscosity or lack of clarity is noticed until the amount of water is about 70 per cent. of the weight of the resin. Increasing the amount of water gradually thins down the solution which becomes milky, but which can readily be cleared up by the addition of alkali. Hydroresin A is completely soluble in alcohol, and small percentages of toluol can be added without affecting the clarity of the product. It blends with waxes, oils, rosin, shellac, latex, casein, glue, etc., forming compounds of interesting properties. Samples and further information can be obtained from the manufacturers the Glyco Products Co., Inc., 148 Lafayette Street, N.Y.C. Agents for the company in this country are Rex Campbell and Co., Ltd., 7 Idol Lane, E.C.3.

THE JANUARY ISSUE of the *Journal* of The Royal Technical College, Glasgow, contains articles upon plate efficiency in fractionating columns, viscosity determinations of slag systems, and the filtration of micro-organisms through paper and sintered glass.

ORDERS HAVE BEEN GIVEN by President Cardenas, of Mexico, that 20 per cent. of the export sales of petroleum shall be reserved as payment for the properties expropriated from 17 British and American oil companies. The total assets involved are estimated at £80,000,000.

IN ORDER TO ENCOURAGE AMATEUR PHOTOGRAPHERS to do their own developing and printing, Burroughs Wellcome and Co., have issued a 24-page booklet which explains how, by employing "Tabloid" photographic chemicals, the bugbear of weighing chemicals and preparing stock solutions can be eliminated.

MACLEANS, LTD., Great West Road, Brentford, have increased their nominal capital by the addition of £100,000 in £1 ordinary shares beyond the registered capital of £1,500,000. Each of the 850,000 ordinary shares of £1 have been sub-divided into 4 shares of 5s.

THE BLAST FURNACES of the Summerlee Iron Co., Coatbridge, which cost more than £1,000,000 and formed one of the best batteries in the United Kingdom, have been blown up for conversion into scrap. The company was founded in 1837, and was one of the most successful until 10 years ago.

DETAILS OF A SCHEME OF FAMILY BONUSES similar to that introduced by Pilkington Bros., Ltd., in February, have been circulated to employees of Tootal Broadhurst Lee Co., Ltd., of Manchester. Under the scheme employees with more than three children under the age of 14 will receive a weekly allowance of five shillings for each child under 14 in excess of three. The payment is limited to employees earning not more than £6 a week. At the discretion of the company the payment of the bonus may be continued for a child who, having reached the age of 14, continues his education on a whole-time basis.

THE FIRST BRITISH FACTORY for the extraction and refining of basking shark oil will be erected at Carradale this summer, providing permission is obtained from the Argyllshire County Council. The application for the erection of the factory is being submitted by Mr. Anthony Y. Watkins, with whom is associated Dr. Secombe Hett, a London surgeon.

HAZELWOOD AND SONS, LTD., chemical manufacturers, Nelson Works, New Lane, Patricroft, near Manchester, have increased their nominal capital by the addition of £4,000 beyond the registered capital of £5,000. The additional capital is divided into 4,000 5 per cent. redeemable cumulative preference shars of £1 each.

S. BRIGGS AND CO., LTD., have issued a leaflet (No. 160/38) relating to aluminium plant. It is stated that in the manufacture of numerous chemical and food products, the use of aluminium equipment avoids discolouration of the product and the creating of toxic salts prejudicial to health, and in consequence is adopted when the purity and colour of the product is important.

EXPLOSIONS OCCURRED WHEN FIRE BROKE OUT at the new factory of the Clyde Soya Meal Co., Ltd., at Shieldhall, Glasgow, on April 4. The building and machinery were badly damaged by water and heat. Production of crude oil from soya beans only began this year, but the fire is not expected to interfere to any great extent.

THE NATIONAL UNION OF DYERS, BLEACHERS AND TEXTILE WORKERS state that the ballot of members showed that 88 per cent. of those who had voted favoured giving notice to terminate the agreement with the employers. The number who voted has not been divulged, but it is described as a high percentage of the membership. The employers have been informed that unless satisfactory arrangements are made before the end of May on the basis of the union's recent application respecting wages conditions, formal notice of three months from June 1 will be given to terminate the agreement affected. Approximately 85,000 operatives are affected.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

PROCESS, ETC., FOR COOLING ROASTER GASES.—Soc. of Chemical Industry in Basle. (Switzerland, March 25, '37.) 8631.

MANUFACTURE OF KETONES, ETC., OF THE CYCLOPENTANO-POLYHYDROPHENANTHRENE SERIES.—Soc. of Chemical Industry in Basle. (Switzerland, March 29, '37.) 8913; (Switzerland, March 29, '37.) 8914; (Switzerland, Feb. 28.) 8915.

PREPARATION OF ANTISEPTICS.—E. T. Tisza. 8441.

CONCENTRATION, ETC., OF SULPHURIC ACID.—N. Titlestad, L. N. Allen, and Chemical Construction Corporation. 8477.

TREATMENT OF METAL SURFACES TO PREVENT CORROSION.—J. L. de Vou. 8647.

RECOVERY OF GLYCEROL from still residues from fermentation processes.—R. A. Walmesley, and Imperial Chemical Industries, Ltd. 8966.

SYNTHESIS OF ORGANIC COMPOUNDS.—J. Wenghart. (Germany, March 17, '37.) 8319.

PRODUCTION OF ALLOYS.—Alloys, Ltd. (United States, March 26, '37.) 9498; (United States, Oct. 25, '37.) 9499.

SULPHONATED TERPENYL-ALYKI-PHENOLS.—American Cyanamid and Chemical Corporation. (United States, June 26, '37.) 9170.

METHODS OF CLEANING MAGNESIUM, ETC.—American Magnesium Corporation. (United States, April 7, '37.) 9192.

PRODUCTION OF MOTOR FUEL.—Anglo-Iranian Oil Co., Ltd., A. E. Dunstan, and S. F. Birch. 9397.

MANUFACTURE OF MERCAPTOBENZTHIAZOLE DERIVATIVES.—W. Baird, and Imperial Chemical Industries, Ltd. 9276.

PRODUCTION OF POWER GAS.—H. A. Blackwell and W. L. Turner. 9107.

PRODUCTION OF MATERIAL PATTERNED IN COLOUR.—Bombay Dyeing and Manufacturing Co., Ltd., and W. B. Pilkington. 9640.

DETECTION OF GASES.—J. L. Brandler. 9690.

PROCESS FOR REMOVING CARBONIC OXIDE from combustible gases. R. Brandt. 9539.

TREATMENT OF JUTE, ETC.—J. Carlin. 9613.

MANUFACTURE OF K-STROPHANTHINE-β.—Chemical Works, formerly Sandoz. (Switzerland, April 21, '37.) 9456.

PREPARATION OF STEROL OXIDATION PRODUCTS.—Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Reszvenytarsasag (Dr. Kereszty and Dr. Wolf.) (Hungary, March 26, '37.) 9077; (Hungary, Feb. 24.) 9078.

PRODUCTION OF POLYHYDROXYFUCHSONE DERIVATIVES.—Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Reszvenytarsasag (Dr. Kereszty and Dr. Wolf.) (Hungary, March 26, '37.) 9278.

INSECTICIDES, ETC.—Corporate Industries, Ltd., and C. Wright-Robb. 9095.

MANUFACTURE OF CONCRETE, ETC.—J. M. Crabbe. 9484.

PROCESS FOR RENDERING MATERIALS MOTH-PROOF, ETC.—J. R. Geigy, A.-G. (Switzerland, April 1, '37.) 9764.

MANUFACTURE OF RARE-EARTH FLUORIDES.—General Electric Co., Ltd., F. S. Hawkins, and J. M. Herbert. 9721.

TREATMENT OF MATERIALS for production of chemical reactions, etc.—A. R. Griggs. 9459.

MANUFACTURE OF MONO-AZO-DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie.) 9051, 9224.

MANUFACTURE OF MOLECULAR COMPOUNDS.—W. W. Groves (I. G. Farbenindustrie.) (July 30, '37.) 9225.

MANUFACTURE OF MONOVINYLACETYLENE.—W. W. Groves (I. G. Farbenindustrie.) 9454.

MANUFACTURE OF CYCLOALKANES.—W. W. Groves (I. G. Farbenindustrie.) 9455.

SENSITISING PHOTOGRAPHIC EMULSIONS.—W. W. Groves (I. G. Farbenindustrie.) 9724.

MANUFACTURE OF DISPERSIONS, ETC.—W. W. Groves (I. G. Farbenindustrie.) 9725.

MANUFACTURE OF KETO-SULPHONIC ACIDS, ETC.—W. W. Groves (I. G. Farbenindustrie.) 9726.

TREATMENT OF CHROMIUM ORES.—W. Heue. 9580.

IRON DESULPHURISATION.—R. P. Heuer. (April 17, '37.) (United States, Aug. 19, '36.) 9633; (April 17, '37.) (United States, Feb. 1, '37.) 9634.

ELECTROLYTIC PRODUCTION OF MANGANESE COMPOUNDS.—F. Hochwald. 9506.

MANUFACTURE OF ESTERS OF β-ACETAMINOBUTYRIC ACID.—Hoffmann-La Roche and Co., A.-G. (Germany, May 29, '37.) 9533.

MANUFACTURE OF DISUBSTITUTED CARBAMIC ACID ESTERS OF PHENOLS.—F. Hoffman-La Roche and Co., A.-G. (Germany, April 24, '37.) 9735.

POLYMERISATION OF DIAMINES.—I. G. Farbenindustrie. (Germany, March 25, '37.) 9049.

REGENERATION OF FUSED SALTPETRE BATHS.—I. G. Farbenindustrie. (Germany, April 27, '37.) 9507.

MANUFACTURE, ETC., OF SUBSTANCES having tanning action.—I. G. Farbenindustrie. 9749.

MANUFACTURE, ETC., OF LIQUID POLYMERISATION PRODUCTS from olefines.—I. G. Farbenindustrie. 9471.

TREATMENT OF COAL WITH GASES.—Institution of Gas Engineers, South Metropolitan Gas Co., and E. V. Evans. 9569.

COATING OF FINELY-DIVIDED SOLIDS.—L. Mellersh-Jackson (Lyons). 9359.

PURIFICATION OF ACETYLENE.—I. G. Farbenindustrie. 9475.
CONTINUOUS EMULSION POLYMERISATION.—G. W. Johnson (I. G. Farbenindustrie.) 9050.
ADHESIVES.—G. W. Johnson (I. G. Farbenindustrie.) 9472, 9473, 9474.
MANUFACTURE, ETC., OF LUBRICANTS.—G. W. Johnson (I. G. Farbenindustrie.) 9236.
CATALYTIC SPLITTING OF HYDROCARBON OILS.—G. W. Johnson (I. G. Farbenindustrie.) 9237.
WORKING UP NICKEL-COPPER MATTES.—G. W. Johnson (I. G. Farbenindustrie.) 9238.
MANUFACTURE, ETC., OF SULPHONATION PRODUCTS of aliphatic ketones.—G. W. Johnson (I. G. Farbenindustrie.) 9590.
THERMAL TREATMENT OF CARBONACEOUS SUBSTANCES.—G. W. Johnson (I. G. Farbenindustrie.) 9747.
PROCESS FOR EXTRACTING CELLULOSE from lignified fibrous material.—W. T. Kerr. 9586.
MANUFACTURE OF CELLULOSE-DERIVATIVE SHEETINGS.—Kodak, Ltd. (United States, March 26, '37.) 9301.
HYDROXYALKYL CYANINE DYES, ETC.—Kodak, Ltd. (United States, March 29, '37.) 9535.
EMULSIONS.—Kodak, Ltd. (United States, March 29, '37.) 9536, 9537.
MOULDING OF PLASTIC MASSES.—V. Lefebure, J. B. Sandford, and Imperial Chemical Industries, Ltd. 9275.
TREATMENT OF METALLIC BODIES.—Linde Air Products Co. (United States, April 24, '37.) 9656; (United States, April 26, '37.) 9657.
PRODUCTION OF COLOURING MATTERS.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. 9520.
MANUFACTURE OF ORGANIC COMPOUNDS.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. 9521.
COLOURING MATTERS.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. 9522.
PRODUCTION OF ORGANIC COMPOUNDS.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. 9523.
PRODUCTION OF TOLUIDINE DERIVATIVES.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. 9524.
PRODUCTION OF ANILINE DERIVATIVES.—Manchester Oxide Co., Ltd., J. H. Clayton, and B. Bann. 9525.
TREATMENT OF CARBONISED METAL.—Marconi's Wireless Telegraph Co., Ltd. (United States, March 27, '37.) 9438.
MANUFACTURE OF ALUMINIUM SULPHATE from kaolin.—N. Martinet, C. Bogdanoff, and Laboratoire Egé. 9079.
PRODUCTION OF BARIUM SULPHIDE from barytes.—Metallges. A.-G. (Germany, June 30, '37.) 9227.

Specifications Open to Public Inspection

PRODUCTION OF BASIC STEEL.—Roehlingsche Eisen-und Stahlwerke Ges. Sept. 24, 1936. 11857/37.
PRODUCTION OF HEAVY METALS.—C. A. Bolton. Sept. 26, 1936. 20790/37.
METHODS OF PRODUCING COMMERCIAL ALKALI PHOSPHATES.—Persil-Ges. Henkel and Voith. Sept. 21, 1936. 22208/37.
TREATMENT OF MATERIALS containing metallic sulphides.—Norsk Raffineringsverk Aktieselskab. Sept. 26, 1936. 22755/37.
LUBRICATING-OILS.—Standard Oil Development Co. Sept. 22, 1936. 23084/37.
MANUFACTURE OF CELLULOSE FIBRES resembling wool.—I. G. Farbenindustrie. Sept. 22, 1936. 23691/37.
METHODS FOR THE PRODUCTION OF SALTS.—Norsk Hydro-Elektrisk Kvaelstofaktieselskab. Sept. 22, 1936. 24873/37.
SAPONIFICATION OF SHAPED ARTICLES comprising hydrolisable compounds of high molecular weight.—I. G. Farbenindustrie. Sept. 23, 1936. 24986/37.
PREPARATION OF VITAMIN CONCENTRATE.—Eastman Kodak Co. Sept. 21, 1936. 25250/37.
PROCESS FOR RENDERING MATERIALS MOTH-PROOF, and materials treated thereby.—J. R. Geigy, A.-G. Sept. 26, 1936. 25297/37.
MANUFACTURE OF CYCLIC HYDROCARBON.—I. G. Farbenindustrie. Sept. 24, 1936. 25581/37.
MANUFACTURE OF A DITERPENE.—I. G. Farbenindustrie. Sept. 24, 1936. 25582/37.
PROCESS FOR REGENERATING CATALYSTS for benzine synthesis.—Ruhrchemie, A.-G. Sept. 22, 1936. (Cognate Application, 25651/37.) 25650/37.
DECARBONISING COMMERCIAL NICKEL OF COBALT.—R. Bosch, A.-G. Sept. 22, 1936. 25658/37.
MANUFACTURE, ETC., OF CHLOR-ETHERS.—G. W. Johnson (I. G. Farbenindustrie.) 9748.
PURIFICATION OF OIL or other liquids.—Aktiebolaget Separator. Sept. 25, 1936. 25704/37.
MANUFACTURE OF VITREOUS LAYERS.—Naamlooze Vennootschap Philips' Gloeilampenfabrieken. Sept. 26, 1936. 25822/37.
MANUFACTURE AND PRODUCTION OF SULPHONATION PRODUCTS.—I. G. Farbenindustrie, and Standard Oil Development Co. Sept. 23, 1936. 25839/37.
TREATMENT OF COAL-TAR OIL.—Steinkohlen-Bergwerk "Rheinpreussen" Abt. Treibstoffwerk. Sept. 24, 1936. 25879/37.
MANUFACTURE OF METHYLVINYL KETONE.—I. G. Farbenindustrie. Sept. 26, 1936. 25949/37.
PROCESS FOR PRODUCING COMPACTLY SINTERED CERAMIC MASSES. Rosenthal-Isolatoren Ges. Sept. 24, 1936. 26007/37.

Specifications Accepted with Dates of Application

POLYMERISATION OF CASHEW NUT SHELL LIQUID.—A. H. Stevens (Harvel Corporation). June 19, 1936. (Convention date not granted.) 481,960.
TREATMENT OF HYDROCARBONS.—A. H. Stevens (Phillips Petroleum Co.). June 24, 1936. 482,271.
MANUFACTURE OF DYESTUFFS FOR DYEING LEATHER.—G. W. Johnson (I. G. Farbenindustrie.) Aug. 21, 1936. 482,192.
PRODUCTION OF LUBRICATING-OILS from olefines.—L. Horton. Sept. 19, 1936. 482,276.
MANUFACTURE OF ALKYLOLAMINES.—H. Dreyfus. Sept. 19, 1936. 482,126.
MANUFACTURE OF MONOAZO-DYESTUFFS insoluble in water.—W. W. Groves (I. G. Farbenindustrie.) Sept. 21, 1936. (Convention date not granted.) 482,198.
APPARATUS FOR THE MANUFACTURE AND PRODUCTION OF SOAPS from oxidation products of non-aromatic hydrocarbons.—G. W. Johnson (I. G. Farbenindustrie.) Sept. 21, 1936. 482,277.
PRODUCTION OF RESINOUS COMPOSITIONS.—E. I. du Pont de Nemours and Co., and D. E. Edgar. Sept. 22, 1936. 482,281.
BRIGHT-DIPPING OF ELECTRODEPOSITED ZINC COATINGS.—Imperial Chemical Industries, Ltd. (E. I. du Pont de Nemours and Co.). Sept. 22, 1936. 482,282.
MANUFACTURE OF DYESTUFFS of the anthraquinone series.—W. W. Groves (I. G. Farbenindustrie.) Sept. 23, 1936. 482,130.
MANUFACTURE OF DYESTUFFS.—I. G. Farbenindustrie. Oct. 4, 1935. 482,131.
MANUFACTURE OF CRYSTALLINE MAGNESIUM HYDROXIDE.—H. H. Chesny. Sept. 24, 1936. 482,339.
MAGNESIA REFRACTORIES.—H. H. Chesney. Sept. 24, 1936. 482,340.
MANUFACTURE OF DISAZO-DYESTUFFS soluble in water.—W. W. Groves (I. G. Farbenindustrie.) Sept. 24, 1936. 482,342.
MANUFACTURE OF WAX-LIKE PRODUCTS.—A. Carpmael (I. G. Farbenindustrie.) Sept. 24, 1936. 482,209.
COLOURATION OF TEXTILE MATERIALS.—R. W. Monerieff, and A. W. M. Cooke. Sept. 25, 1936. 482,344.
PRODUCTION OF DYED OR PRINTED MATERIALS.—W. W. Groves (Soc. of Chemical Industry in Basle.) Sept. 25, 1936. 482,345.
ADHESIVES.—A. Carpmael (I. G. Farbenindustrie.) Sept. 25, 1936. 482,292.
MANUFACTURE OF SHAPED CELLULOSE ARTICLES.—I. G. Farbenindustrie. Sept. 28, 1935. 482,296.
MANUFACTURE OF NITRILES of the C$_4$-series containing oxygen. I. G. Farbenindustrie. Sept. 28, 1935. 482,300.
PROCESSES INVOLVING THE MELTING OF BORIC ACID, borax, or phosphates.—I. G. Farbenindustrie. Sept. 27, 1935. 482,303.
MANUFACTURE AND PRODUCTION OF POLYAMINO CARBOXYLIC ACIDS and their derivatives.—G. W. Johnson (I. G. Farbenindustrie.) Sept. 28, 1936. 482,352.
MANUFACTURE AND PRODUCTION OF COATING-COMPOSITIONS.—I. G. Farbenindustrie. Sept. 28, 1936. (Addition to 465,645.) 481,969.
MANUFACTURE OF ZINC OXIDE, particularly of zinc-white pigments.—Smelting Metallurgische-und Metallwerke, A.-G. Sept. 28, 1935. 481,971.
ALKALI SILICATE CEMENTS, and articles bonded by such cements. Carborundum Co. Oct. 4, 1935. 482,307.
ALKALI SILICATE CEMENTS, and articles bonded by such cements. Carborundum Co. Oct. 4, 1935. 482,308.
MANUFACTURE OF POLYVINYL ACETALS.—W. W. Groves (I. G. Farbenindustrie.) Oct. 2, 1936. 482,219.
LOW-TEMPERATURE DISTILLATION OF COAL LIGNITE or other solid distillable carbonaceous material.—F. Tassara. Oct. 4, 1935. 481,973.
SOFTENING WATER.—G. W. Kuhl. Oct. 7, 1935. 482,141.
PROCESSES FOR THE MANUFACTURE OF MAGNESIUM.—D. Gardner. Oct. 31, 1936. 482,149.
PROCESSES FOR THE MANUFACTURE OF ALUMINIUM.—D. Gardner. Oct. 31, 1936. 482,150.
PROCESSES FOR THE MANUFACTURE OF MAGNESIUM or alloys thereof.—D. Gardner. Dec. 3, 1936. 482,157.
PRODUCTION OF AMINES.—C. Barbieri. Jan. 20, 1937. 482,008.
PROCESS FOR THE MANUFACTURE OF FREE SH-GLUTATHIONE and its alkaline-earth metal salts.—Schering-Kahlbaum, A.-G. March 6, 1936. 482,015.
MANUFACTURE OF SATURATED and unsaturated ketones of the pregnan series.—Soc. of Chemical Industry in Basle. March 23, 1936. 482,321.
MANUFACTURE OF ACID MONOAZO-DYESTUFFS.—J. R. Geigy, A.-G. March 5, 1936. (Samples furnished.) 482,171.
ELECTRICAL INSULATING MATERIALS.—Siemens and Halske, A.-G. March 9, 1936. 482,172.
MANUFACTURE OF WATER-SOLUBLE CONDENSATION PRODUCTS containing phosphorus.—J. R. Geigy, A.-G. March 21, 1936. 482,018.
PROCESS FOR THE WORKING-UP OF LEAD ORES.—Metallges, A.-G. May 16, 1936. 482,224.
TREATMENT OF ALUMINOUS SILICIOUS MATERIAL.—Electric Smelting and Aluminium Co. June 11, 1936. 482,326.
RECOVERY OF ANTI-KNOCK MOTOR FUEL from synthetic process gases.—Carbo-Norit-Union Verwaltungs-Ges. July 10, 1936. 482,093.

EXTRACTION OF GOLD AND/OR SILVER FROM ORES and metallurgical products.—V. T. Edquist. Aug. 6, 1936. 482,095.

PRIMARY TRIAZO DYESTUFFS derived from resorcinol, their copper compounds, and process for their manufacture.—J. R. Geigy, A.-G. July 13, 1936. 482,240.

METHOD OF REMOVING IRON FROM NATURALLY-OCCURRING MAGNESIUM SILICATES.—Steatit-Magnesia, A.-G. July 14, 1936. 482,243.

DE-WAXING MINERAL OILS.—H. D. Elkington (Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij). Aug. 31, 1937. 482,253.

PRODUCTION OF CRYSTALS.—Telefunken Ges. Fur Drahtlose Telegraphie. July 14, 1936. 482,096.

DYEING AND PRINTING MATERIALS.—Soc. of Chemical Industry in Basle. (Aug. 17, 1935. (Divided out of 480,358.) (Cognate Applications, 20529/37 and 20530/37.) (Samples furnished.) 482,184.

PREPARATION OF ARTIFICIAL RESINS.—A. Nowack, A.-G., and R. Hessen. Aug. 3, 1936. 482,100.

COMPOSITE MATERIALS of polyvinyl halide and solid backing materials, and methods of making the same.—B. F. Goodrich Co. Nov. 24, 1936. 482,122.

Company News

William Blythe, Ltd., chemical manufacturers, announce a net profit for 1937, of £35,806 (£33,115), less reserve for taxation £4,677 (£2,730); final of 7 per cent. (subject to tax), making 10 per cent. (same); to general reserve, £9,000 (£8,000); forward, £3,543 (£3,473).

John Dickinson and Co., paper makers, show a jump of £92,274 to £369,290, in net profits. The ordinary dividend is unchanged at 10 per cent., but the bonus is doubled at 4 per cent. The transfer to general reserve is increased from £50,000 to £100,000, and £35,000, against £25,000, is placed to contingency reserve, leaving the carry-forward nearly £4,000 higher at £76,970. The 5 per cent preference shares of the company are to be converted into stock.

British Enka Artificial Silk report a working profit for 1937 of £44,214 (£43,575); after charging debenture and other interest and sundry items totalling £19,474 (£20,667), depreciation £37,076 (£35,804) and tax £2,028 (nil), there was net loss of £14,364 (£12,896); exchange reserve of £26,022 exceeds amount required at Guilder-Sterling exchange rate at December 31 by £20,509. Production and sales were somewhat higher than those of the previous year.

Palestine Potash, Ltd., show a gross profit for 1937 of £86,774 (£59,267), plus fees £24 (£16 and interest £912), making £86,798 (£60,195). Expenses in London and Palestine £29,106 (£28,484), interest £2,137 (nil), directors' remuneration £2,000 (same), repairs and replacements £5,723 (£2,831). Net trading profit £47,831 (£26,881). The directors have this year made provision for amortisation and depreciation of £30,000. Anglo-Palestine Bank guaranteed payment of the company's preference dividend from January 1, 1935, to June 30, 1937. Subsequent half-yearly dividend has been paid out of earnings.

Cellon, Ltd., manufacturers of aeroplane dopes, shows a trading profit for 1937 of £38,744 (£35,380); net profit, £38,175 (£34,596); written off goodwill, £5,000 (£4,750); reserve fund, £5,000 (same); final of 12½ per cent., making 20 per cent. (same); forward, £4,339 (£2,192).

Van den Berghs and Jurgens, Ltd., a member of the Lever Bros. and Unilever group, earned considerably increased profits in 1937, and the ordinary dividend is raised by 5½ per cent., to 12½ per cent. Trading profits, dividends and interest, etc., at £1,438,196 show an advance of £230,003, and the net figure, before tax, is up from £940,040 to £1,172,643. Income-tax and N.D.C. requires £323,096, against £187,787. The allocation to reserve is repeated at £200,000, and there is a new allocation of £50,000 to contingencies reserve. The ordinary dividend absorbs £715,462, leaving the carry-forward at £150,325, compared with £266,167. A feature of the balance-sheet is an increase in investments from £3,808,682 to £5,921,948.

United Premier Oil and Cake Co., in their report, show that income during 1937 was well maintained. Dividends ,etc., from subsidiary companies amounted to £96,458, compared with £93,836 in the previous year. The latter figure, however, was brought up to £117,484 by the inclusion of £23,648, representing available profits of previous years. After deducting expenses, debenture interest, etc., and allowing £13,162, against £16,917 for tax, an amount of £62,910 was earned for dividends, compared with £56,467 in 1936 before crediting the special sum mentioned above. The total distribution for the year is maintained at 12½ per cent., with a final dividend of 5 per cent., and cash bonus of 2½ per cent. After placing £10,000, against £25,022 to reserve, the carry-forward is raised slightly from £39,855 to £39,877.

Chemical and Allied Stocks and Shares

THE industrial and kindred sections of the stock and share markets have developed a better tendency since the beginning of the new Stock Exchange account on Monday. Best prices have not been held, but the undertone is described as steadier than of late, sentiment having benefited from more hopeful views in regard to the Budget.

Among shares of chemical and allied companies Imperial Chemical have been active following publication of the full report, and although now "ex" the dividend, have risen on balance from 29s. 10½d. to 30s. 9d. British Oxygen improved strongly, having rallied from 73s. to 78s. 9d., while Turner and Newall at 80s. also moved sharply in favour of holders. Murex, which were active around 82s. 6d., continued to attract attention on the possibility of a larger interim payment. British Aluminium were in steady request and have moved up to 49s. on further consideration of the statements at the meeting. The market is taking the view that the earning capacity of the latter company is likely to benefit a good deal from the expansion of the business now in progress, and that, despite the larger capital that will rank this year, there are reasonable prospects of the higher dividend rate of 12½ per cent. being maintained. Wall Paper Manufacturers' deferred units improved 9d. to 36s. in response to expectations that the forthcoming interim dividend will again prove to be 5 per cent.

British Match were steady around 34s. 3d. Although the market is looking for larger profits from this company there are doubts whether the dividend will be increased, bearing in mind the conservative policy invariably followed by the directors. British Glues were inactive, but these 4s. shares have remained at 5s. 7½d. It may be recalled that in respect of the year to April, 1937, the net profits of this company increased to £61,525, and that the dividend was raised to 10 per cent. The latter was a very conservative payment as earnings on the ordinary shares exceeded 30 per cent.

Boots Pure Drug were more active and have improved on the week from 42s. to 43s. 9d. The market is talking of a further increase in profits, but the general belief persists that the directors are unlikely to raise the cash distribution, the assumption being that they intend to provide out of resources for the steady growth of the business and thus obviate the raising of additional capital. Nevertheless, it is thought in many quarters that, when considered desirable, the directors may distribute a scrip bonus. Saugers 5s. shares were little changed at 20s. 10½d., but have been more active on hopes that the dividend on the larger capital may be maintained. In respect of the year ended March, 1937, there was an increase in net profits from £146,040 to £150,427 and the 25 per cent. paid on the smaller capital was covered by earnings equivalent to nearly 30 per cent. Timothy Whites and Taylors fluctuated moderately around 26s., but these 5s. shares have again been active, awaiting publication of the results of the past accounting period.

Fison Packard and Prentice at 32s. 6d., and Cooper McDougall and Robertson at 28s. 9d. were steady features this week. General Refractories were moderately better at 15s. under the influence of the directors' recent circular regarding the impending results. William Blythe 3s. shares are 5s. 1½d. xch., following publication of the full results. British Industrial Plastics 2s. shares continued to change hands actively around 2s. 3d.

United Glass Bottle have been very firm and made the rather better price of 48s. 9d. xch. on the excellent impression created by the past year's figures, which are the first to reflect the expansion of business resulting from the acquisition of British Bottles, full benefits from which have probably not yet accrued. The raising of the dividend from 11 per cent. to 12 per cent. is in accordance with the prudent policy invariably followed. Actual earnings on the ordinary shares work out at rather more than 22 per cent.

Among iron and steel shares Colvilles, Dorman Long and many others were more active, but best prices were not held. In other directions there was improvement in Associated Portland Cement ordinary to 75s. on further consideration of the statements at the recent meeting. "Shell" and other leading oil shares failed to hold the improved prices made earlier in the week.

Weekly Prices of British Chemical Products

THE demand for general chemicals has not shown any great improvement during the past week, but there has certainly been a little more interest in most sections and the market is very steady in tone. A fair inquiry is circulating for chlorate of soda, lithopone, formaldehyde, tartaric acid and citric acid, and caustic potash is reported firm. There are no outstanding price changes to record for general chemicals, rubber chemicals and wood distillation products and quotations continue on a steady basis. An expansion in the volume of inquiry is reported in the coal tar section and although there is, as yet, no substantial buying in evidence, an early improvement in the market position is anticipated. Prices on the whole have a firmer tendency and present quotations are regarded as nominal.

Price Changes

Rises: Potash Caustic, solid; Copper Sulphate (Scotland).

Falls: Lithopone; Creosote, home trade.

MANCHESTER.—Relatively quiet conditions have been reported in most sections of the Manchester chemical market during the past week, and the bulk of the new business transacted has been for small lots for near delivery dates. There is room for improvement still in the rate at which textile chemicals are being called for in Lancashire, but in most other branches of the consuming industries locally fair contract deliveries are being taken up. Apart from one or two products the general price tendency remains steady. In the case of the tar products trade this week has been dull in pretty well all directions, and supplies against contracts are not in most instances being absorbed as well as they should be. Although the tone is far from strong actual changes on the week have been unimportant.

GLASGOW.—There has been a further slight improvement in the demand for chemicals for home trade during the week, but no improvement in export business. Prices generally continue very steady, with no important changes to report.

General Chemicals

ACETONE.—£45 to £47 per ton.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 2s. 6d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £19 per ton, ex wharf.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8¼d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £16 10s. per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £11 10s. per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHROMETAN.—Crystals, 2¼d. per lb; liquor, £19 10s. per ton d/d. station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—9¾d. per lb., less 2½%; d/d U.K.

CHROMIUM OXIDE.—11d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0½d. per lb. MANCHESTER: 1s. 0½d. SCOTLAND: B.P. crystals, 1s. 0½d. per lb; less 5%, ex store.

COPPER SULPHATE.—£21 7s. 6d. per ton, less 2% in casks. MANCHESTER: £18 15s. per ton f.o.b. SCOTLAND: £19 10s. per ton, less 5%, Liverpool, in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £4 12s. 6d. to £5 12s. 6d per cwt. according to quantity; in drums, £4 5s. 0d. to £4 17s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 4d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £32; brown, £1 per ton less. MANCHESTER: White, £32; brown, £31.

LEAD, NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£32 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £32 per ton, less 2¼% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £32 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 10d. per lb.; powder B.P., 6s. 0d.; bichloride B.P. (corros. sub.) 5s. 1d.; powder B.P. 4s. 9d.; chloride B.P. (calomel), 5s. 10d.; red oxide cryst. (red precip.), 6s. 11d.; levig. 6s. 5d.; yellow oxide B.P. 6s. 3d.; persulphate white B.P.C., 6s. 0d.; sulphide black (hvd. sulph. cum sulph. 50%), 5s. 11d. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £54 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3¾d. per lb.

POTASH, CAUSTIC.—Solid, £35 5s. to £40 per ton according to quantity, ex store; broken, £42 per ton. MANCHESTER: £39.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 10s. per ton.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. SCOTLAND: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 5s. 6d per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¾d. per lb. SCOTLAND: B.P. Crystals, 9¾d. MANCHESTER: B.P. 10¾d. to 1s.

POTASSIUM PRUSSIATE.—6½d. per lb. SCOTLAND: 7d. net, in casks, ex store. MANCHESTER: Yellow, 6½d.

SALAMMONIAC.—Firsts lump, spot, £42 17s. 6d. per ton, d/d address in barrels. Dog-tooth crystals, £36 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 11s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, 13s. 10s. per ton d/d station. SCOTLAND: Powdered 98.99%, £'8 10s. in drums, £19 5s. in casks. Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2 cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 15s. per ton d/d station in bags. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. MANCHESTER: £10 10s.

SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.

SODIUM DICHROMATE.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts. MANCHESTER: 4d. per lb.

SODIUM CHROMATE.—4¼d. per lb. d/d U.K. GLASGOW: 4¼d. net, carriage paid.

SODIUM HYPOSULPHITE.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.

SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.

SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s. 0d. per cwt. in 1-cwt kegs, net, ex store.

SODIUM NITRITE.—£18 5s. per ton for ton lots.

SODIUM PERBORATE.—10%, 9½d. per lb. d/d in 1-cwt. drums.

SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £15 to £16 per ton delivered per ton lots.

SODIUM PRUSSIATE.—5d. per lb. for ton lots. GLASGOW: 5d. to 5¾d. ex store. MANCHESTER: 4½d. to 5½d.

SODIUM SILICATE.—£8 2s. 6d. per ton.

SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.

SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.

SODIUM SULPHIDE.—Solid 60/62%. Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.

SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

TARTARIC ACID.—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb. GLASGOW: 1s. 1d. per lb., 5%, ex store.

ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARYTES.—£6 to £6 10s. per ton, according to quality.

CADMIUM SULPHIDE.—6s. to 6s. 3d. per lb.

CARBON BLACK.—4d. per lb., ex store.

CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.

CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.

CHROMIUM OXIDE.—Green, 10½d. to 11d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

INDIA-RUBBER SUBSTITUTES.—White, 4¾d. to 5½d. per lb.; dark 4d. to 4½d. per lb.

LAMP BLACK.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.

SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.

VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.

ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1938: November, £7 8s.; December, £7 9s. 6d.; January, 1938, £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.

CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1938: November, £7 10s.; December, £7 11s. 3d.; January, 1938, £7 12s. 6d.; February, £7 13s. 9d.; March, £7 15s.; April/June, £7 16s. 3d.

NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1938.

SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1938.

CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.

AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9¼d. to 9¾d. per gal.; standard motor, 1s. 2¾d. to 1s. 3¼d.; 90%, 1s. 3¾d. to 1s. 4¼d.; pure, 1s. 7¾d. to 1s. 8¼d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4¼d.

CARBOLIC ACID.—Crystals, 7¾d. to 8¼d. per lb., small quantities would be dearer; Crude, 60's, 3s. 6d. to 3s. 9d.; dehydrated, 4s. 4½d. to 4s. 7½d. per gal. MANCHESTER: Crystals, 7½d. per lb. f.o.b. in drums; crude, 3s. to 3s. 6d. per gal.

CREOSOTE.—Home trade, 5¼d. per gal., f.o.r. makers' works; exports, 6¾d. to 6¾d. per gal., according to grade. MANCHESTER: 4½d. to 5½d. GLASGOW: B.S.I. Specification, 6d. to 6¼d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5¾d. to 6¼d.

CRESYLIC ACID.—97/99%, 2s. 5d. to 2s. 8d.; 99/100%, 4s. to 5s. 6d. per gal., according to specification; Pale, 99/100%, 2s. 9d. to 3s.; Dark, 95%, 2s. 4d. to 2s. 5½d. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 3s. 9d. to 4s. MANCHESTER: Pale, 99/100%, 3s.

NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. GLASGOW: Crude, 6½d. to 7½d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.

NAPHTHALENE.—Crude, whizzed or hot pressed, £5 5s. to £6 5s. per ton; purified crystals, £14 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 10s. to £7 per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £15 10s. per ton f.o.b.

PITCH.—Medium, soft, 35s. per ton, f.o.b. MANCHESTER: 32s. f.o.b., East Coast. GLASGOW: f.o.b. GLASGOW: 35s. to 37s. per ton; in bulk for home trade, 35s.

PYRIDINE.—90/140%, 13s. 6d. to 15s. per gal.; 90/160%, 10s. 6d. to 13s. 3d. per gal.; 90/180%, 3s. 3d. to 4s. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 11s. 6d. to 13s. per gal.

TOLUOL.—90%, 1s. 10d. per gal.; pure, 2s. 2d. GLASGOW: 90%, 120, 1s. 10d. to 2s. 1d. per gal.

XYLOL.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 3d. to 2s. 3½d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 10s. to £8 per ton; grey, £9 10s. to £10. MANCHESTER: Brown, £9 10s.; grey, £11 10s.

METHYL ACETONE.—40.50%, £35 to £40 per ton.

WOOD CREOSOTE.—Unrefined, 4d. to 6d. per gal., according to boiling range.

WOOD NAPHTHA, MISCIBLE.—3s. 3d. to 3s. 6d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.

WOOD TAR.—£2 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.

BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11d. per lb. d/d buyer's works.

m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-CRESOL 30/31° C.—6½d to 7½d. per lb. in 1-ton lots.

p-CRESOL, 34.5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.

DICHLORANILINE.—2s. 1½d. to 2s. 5½d. per lb.

DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.

DINITROBENZENE.—8½d. per lb.

DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.

DINITROTOLUENE.—48/50° C., 9¼d. per lb.; 66/68° C., 11d.

DIPHENYLAMINE.—Spot, 2s. 2d. per lb., d/d buyer's works.

GAMMA ACID, Spot, 4s. 4½d. per lb. 100% d/d buyer's works.

H ACID.—Spot, 2s. 7d. per lb.; 100% d/d buyer's works.

NAPHTHIONIC ACID.—1s. 10d. per lb.

β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.

α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.

β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.

NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.

o-NITRANILINE.—4s. 3½d. per lb.

m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 10d. to 2s. 3½d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

NITRONAPHTHALENE.—10½d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

SULPHANILIC ACID.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-TOLUIDINE.—11½d. per lb., in 8/10-cwt. drums, drums extra.

p-TOLUIDINE.—2s. per lb., in casks.

m-XYLIDINE ACETATE.—4s. 8d. per lb., 100%.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Receiverships

WESTERN OXIDE AND PAINT COMPANY, LTD., 24 Russell Street, Plymouth. (R., 9/4/38.) C. D. Dromhead, Lloyds Bank Chambers, Bedford Street, Plymouth, was appointed receiver on March 22, 1938, under powers contained in first mortgage debenture dated October 7, 1931.

DUDLEY METAL CO., LTD. (R., 9/4/38.) S. C. Parker, 46 Walker Street, Wellington (Salop). March 28.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

ALUMINIUM PROTECTION CO., LTD., London, N.W. (M., 9/4/38.) March 24, series of £1,600 (not ex.) debentures, present issue £400; general charge. *£16,805. October 8, 1937.

JOHN BRIERLEY, LTD., Manchester, bleachers, dyers, etc. (M., 9/4/38.) March 26, £2,000 supplemental debenture to S. Mack, Manchester, and another; general charge. *——. April 16, 1937.

UNITED STEEL COMPANIES, LTD., Sheffield. (M., 9/4/38.) March 24, charge supplemental to Trust Deed dated October 24, 1934; charged on certain seams of coal at Morthen, Whiston. *£2,478,947. October 29, 1937.

Satisfaction

BRITISH BENZOL AND COAL DISTILLATION, LTD., London, E.C. (M.S., 9/4/38.) Satisfactions March 29, of a deed and a debenture registered April 4, 1933.

Winding-up Petition

DIXON SOAP CO., LTD. (W.U.P., 9/4/38.) A petition for the winding-up of this company by the Manchester County Court, was on March 22, 1938, presented by Premier Soap Co., Ltd., and is to be heard at the Court House, Quay Street, Manchester, on May 2, 1938.

Petition for Reduction of Capital

BRIDGE COLOUR CO., LTD.—A petition has been presented for the confirmation of the reduction of the capital from £67,000 to £46,300, and is to be heard on April 11, 1938. The £20,700 by which the capital is to be reduced is to be carried to a special capital reserve and will be used for capital purposes only and not for paying dividends or bonuses on any shares of the company.

Declaration of Solvency Filed

SUNDERLAND SOAP CO., LTD. (D.S.F., 9/4/38.) March 26.

Receivers Ceasing to Act

HAIGH DYEING CO. (1920), LTD., Wigan.—R. G. Taylor. March 26.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Iran.—Tenders are invited by the Ministry of Industry, Iran, for a plant for the manufacture of nitric acid. Specification may be obtained from the Commercial Attaché to the Imperial Iranian Legation, Ling House, 10-13 South Street, London, E.C.2.

South Africa.—H.M. Senior Trade Commissioner in South Africa reports that the City of Cape Town Council is calling for tenders (Tender No. A15/38) for the supply and delivery of 6,000 6-in. salt glazed pipes, 2 ft. long. Tenders, endorsed "Tenders for Salt Glazed Pipes," should be addressed to the Town Clerk, City Hall, Cape Town, by whom they will be received up to noon on April 25, 1938. (Ref. T. 20072/38.)

South Africa.—H.M. Trade Commissioner at Johannesburg reports that the City Council of Pretoria is calling for tenders, to be presented in South Africa by May 2, 1938, for the supply, delivery and erection of refrigerating plant at the Municipal Abattoirs, Pretoria. (Ref. T.Y. 20107/38.)

New Companies Registered

Bettell, Ltd. 338,529.—Private company. Capital £1,000 in 1,000 shares of £1 each. To acquire the business of chemical engineers carried on as "Bettell and Co.," by S. Angel and H. J. Bettany. Subscribers: Arthur E. Isemonger, 199 Piccadilly, W.1; Warwick J. Lovell.

Dano Fertiliser, Ltd. 338,795.—Private company. Capital £100 in 100 shares of £1 each. To carry on the business of manufacturers of and dealers in fertilisers, manures and animal feeding stuffs, etc. Subscribers: Edward A. P. Forward, 38 King William Street, E.C.4; Ronald Tilbury. Registered office: 38 King William Street, E.C.4.

Varnish Industries, Ltd. 338,691.—Private company. Capital £1,000 in 1,000 shares of £1 each. To carry on the business of manufacturers of and dealers in varnishes, paints, oils, colours, etc. Subscribers: Ernest E. Wallen, 4 Old Kiln Lane, Heaton, Bolton; Stafford W. Wallen, Ernest E. Wallen. Registered office: 59-60 Broad Street Avenue, Blomfield Street, E.C.2.

Defence Equipment, Ltd. 338,796.—Private company. Capital £100 in 100 shares of £1 each. To carry on the business of mechanical and electrical engineers, manufacturers of and dealers in equipment, chemicals, apparatus and devices for use in the defence or protection of the civil population, etc. Subscribers: Cordelia M. Baker, 141 Bennerley Road, S.W.11; Wm. Roberts.

Mula (Chemicals), Ltd. 338,543.—Private company. Capital £100 in 100 ordinary shares of £1 each. To carry on the business of manufacturers of and dealers in chemicals, gases, drugs, medicines, plasters, disinfectants, fertilisers, salts, acids, etc. Directors: Geo. S. James, 28 Sharmans Cross Road, Solihull, Warwickshire; Ernest W. Pewkins. Registered office: Stock Exchange Buildings, Great Charles Street, Birmingham.

Isthmus Size Company, Ltd. 338,856.—Private company. Capital £5,000 in 5,000 shares of £1 each (2,000 6 per cent. cumulative preference and 3,000 ordinary). To acquire the undertaking of Isthmus Size Company, Ltd. (incorporated in 1919), and to carry on the business of size, chemical, colour, dye and dyeware manufacturers, manufacturing chemists, etc. Subscribers: Edgar Moorhouse, Grasmere Road, Huddersfield; Mrs. Frances Moorhouse.

Chiswell Rubber Company, Ltd. 338,557.—Private company. Capital £1,000 in 1,000 shares of £1 each. To carry on the business of manufacturers, importers and exporters of and dealers in rubber, balata and gutta percha and any goods made wholly or partly from rubber, vulcanite or ebony compositions; manufacturing and wholesale and retail chemists, etc. Subscribers: Leslie Cork, 1-2 Finsbury Square, E.C.2; Joseph L. Magnus. Registered office: 1-2 Finsbury Square, E.C.2.

Forthcoming Events

London.

April 11.—Institution of the Rubber Industry. Royal Empire Society, Northumberland Avenue, W.C.2. 7.30 p.m. B. L. Davies, "What is the Strength of Vulcanised Rubber"?

April 12.—Society of Chemical Industry (Plastics Group), Burlington House, Piccadilly, W.1. 7.30 p.m. "Colourless Ketonic Resins."

April 14.—Oil and Colour Chemists' Association. E. W. Plowman, "Factory Testing of Paints and Varnishes."

Bristol.

April 11-13.—The Faraday Society. The University. "Chemical Reactions Involving Solids."

Sheffield.

April 13.—Society of Glass Technology. The University, St. George's Square. 2 p.m. Annual General Meeting. Professor W. E. S. Turner and J. N. Coward, "The Clouding of Glass in Atmospheres Containing Sulphur Dioxide"; W. A. Thorpe, "The Glass Sellers' Bills at Woburn Abbey."

Stoke-on-Trent.

April 11.—The Ceramic Society. North Staffordshire Technical College. 7.30 p.m. F. G. Yorath, "Planning of Ceramic Factories."

Stourbridge.

April 11.—Society of Glass Technology. Midlands Section. Talbot Hotel. 7.30 p.m. Representative of The Blythe Colour Works, Ltd., "Enamels."

Books Received

The Fine Structure of Matter. By C. H. Douglas Clark. Vol. II, Part III, The Quantum Theory and Line Spectra. London: Chapman and Hall, Ltd. Pp. 643. 15s.